Stephanie Dunn

Assessment of the effectiveness of Cardiac Rehabilitation on the maintenance of healthy lifestyle modifications:

An International comparison between England and New Zealand

Dissertation submitted in accordance with the requirements of University of Chester for the degree of Master of Science

Date: 15th September 2010

Acknowledgments

I would like to thank Sally Lark, all those at the Massey Cardiac Clinic, Stephen Fallows, and all participants of the study, for all their support and effort, without which this research would not have been possible.

Abstract

Secondary preventive Cardiac Rehabilitation (CR) programmes are the most cost effective measure for reducing mortality and morbidity associated with Cardiovascular Disease (CVD), and are now recommended internationally (BHF, 2007a). There are two structured CV rehabilitation programmes based on specific sets of guidelines: the American Cardiology Sports Medicine (ACSM) guidelines and the British Association Cardiac Rehabilitation (BACR) guidelines. New Zealand (NZ) practice under the ACSM guidelines, while the United Kingdom (UK) practice under the BACR guidelines. The purpose of this study is to compare patients CR experiences between the UK and NZ based on their effectiveness at successfully motivating patients to maintain healthy behaviours.

Methods: Data was collected from non-participant observations, and focus groups with patients 6-12months post CR.

Results: Results were analysed using thematic analyses and reflection in action. Both CR programmes have been successful in supporting the individuals to maintain healthy lifestyles. A number of similar positive CR experiences were noted between groups and countries: support, education, positive mental attitude, motivation, and help to facilitate individuals to maintain healthy lifestyles. Diet and exercise were the main themes influenced. Exercising in a friendly environment, with companionship was significant to the maintenance of exercise for participants in both countries. Barriers such as physical disabilities, time constraints, and weather conditions helped to inhibit healthy behaviour maintenance. Those in NZ seemed to be more affected by external factors such as opportunity, access, and work. Individuals' confidence appeared higher in the UK in regards to monitoring themselves.

Conclusion: Exploring patients' views and experiences through discussion provided an insight in these programmes, and could assist in future CR developments, addressing the barriers to such developments. The study highlighted that less monitoring in NZ is required. Also, further future developments for NZ could include improving referrals for CR intervention, and improvements in opportunities to access exercise sessions with other CV individuals. Future research into continuing social support through exercise sessions and education discussion groups could be a step towards tackling the drop-out rates in both countries.

Declaration

This work is original and has not been previously submitted in support of a degree, qualification or other course.

Signed……

Date: 15th September 2010

Contents Pages

1. Introduction

Cardiovascular Diseases (CVD) are the leading cause of impairment and death not only in the Western World, such as England (UK) but also in other industrialised countries such as New Zealand (NZ) (NHF, 2002; NHF, 2008, Puska, 2001). In 1998, of all global disease mortality, 30.9% of males and 10.3% of females was attributable to the global burden of CVD (Yusuf, Reddy, Ôunpuu & Anand, 2001).

Both the UK and NZ have similar heart health statistics, with 1/3 of annual deaths being associated with CVD (BHF, 2008, MoH, 2008). Apart from ethnic minorities, this may be due to a similar genetic make up, and also the practicing of similar lifestyles. These deaths result in, a significant burden on the health service in both countries (LaMonte *et al.,* 2000). However, differences occur between the two countries in the organisation of health provision. NZ's health provision is much more individually funded compared to that of the UK, which is publicly funded through the NHS. This could determine the type of treatment readily available in regards to CVD.

CVD and Cardiovascular Rehabilitation (CR)

Countries such as the UK and NZ have reached a stage in which they aim to prevent and diagnose CVD (Yusuf *et al*., 2001). The developing aim to combat these diseases is continuing to grow in both the UK and NZ, through the use of pharmaceutical aids and the growing attempts to establish new CR programmes, whilst improving already existing ones (Mitchie, O'Connor, Bath, Giles, & Earll, 2005). Secondary Prevention CR programmes are the more cost effective measure for reducing CVD mortality and morbidity, and are now recommended nationally and internationally (BHF, 2007a). Therefore, the quality of CR programmes is consequently increasing and has become an integral part of the life of patients' living with CVD (Strong & Hinton, 2007).

SIGN (2002), defines CR as

> 'the process by which patients' with cardiac disease, in partnership with a multidisciplinary team of health care professionals, are encouraged and supported to achieve and maintain optimal physical and psychological health'.

CR programmes aim to stop the CVD progression, reverse the limitations experienced both physiologically and psychologically and prevent any future CVD events or suffering

from the disease. CR mainly aims to encourage these high risk individuals to take control in their recovery, and make relevant changes to reduce the risk of further cardiac events by improving their physical, emotional, social and vocational well-being, consequently improving their own quality of life (BHF, 2007a; Singh, Schocken, Williams & Stamey, 2008; Strong & Hinton, 2007).

CVD, CR and Risk Factors

The complexity of the disease derives from combinations of unchangeable and modifiable aspects known as risk factors, such as age, gender, socioeconomic status, smoking, overweight, physical inactivity and cholesterol to name but a few. CR is achieved through programmes that are based on specific sets of guidelines (Coats, McGee, Stokes & Thompson, 1995). It is important that CR programmes focus on the individual's risk factor profile and as a result improve their knowledge of these and help establish interventions to reduce the effects of risk factors and the disease. Funding and developments of CR aim to decrease the impact of disability and illness on the population, but they can be difficult to plan and justify (Graham, Cameron & Dickson, 2008).

CR, as a multidisciplinary approach, aims to take into account all aspects of the patient's surrounding environment, identify any physical, emotional, psychological, educational, and social aspects, and any other aspects which may subsequently influence their disease status (BHF, 2007a; Singh *et al.,* 2008). Although some risk factors are unchangeable, it is important to realise that improving the modifiable risk factors may have positive indirect effects on these unchangeable risk factors, improving disease status. This subsequently highlights the importance for risk factor modification and maintenance; for example, a person with genetic hypertension may further reduce their blood pressure by increasing their activity levels. CR therefore aims to encourage many lifestyle changes, maintaining them long term, modifying those risk factors, can ensure an improved risk factor profile and better quality of life (Singh *et al*., 2008)

CR Foundation

To ensure each patient who progresses through a CR programme attains all the benefits essential for them adopting new lifestyles and changing their disease status, the National Institute of Clinical Excellence (NICE) (2007) suggests that, effective programmes will

incorporate exercise, psychological support and education. It is therefore important that each patient completes each phase of the CR programme and gains an understanding of themselves and the disease. There are two structured programmes currently existing and each are being utilised within the UK and NZ. NZ practice under the American Cardiology Sports Medicine (ACSM) guidelines, which are currently used in America and many other countries. These consist of three phases within the CR programmes. In contrast, the UK practices under the British Association of Cardiovascular Rehabilitation (BACR) guidelines, which consist of four phases. These guidelines are a further development of the ACSM guidelines.

Progression through each phase of CR can initially result in recovery after a cardiac event, lifestyle modifications and consequently maintaining an improved quality of life. Both structured programmes are supported in their effectiveness to reduce risk factors in cardiac patients' and therefore have become a standard part of cardiac care (Joliffe *et al*., 2001).

CR: Support and Maintenance

Although the two structures may differ, the imperative overall objective of all CR is the progressive support for these patients', in ensuring they can achieve and maintain lifestyle modifications that will have positive health implications, to prevent them suffering further from the disease (SIGN, 2002). Education that is readily available in both structures informs the individuals of healthy heart lifestyles and aims to motivate these patients' throughout the programme, to overcome the challenge of adopting what they have learnt in CR and maintain these behaviours long term. This maintenance is essential to a patient's well-being, as cardiac and high risk patients' who comply with prescribed programmes, and maintain the encouraged lifestyle modifications (e.g. exercise, weight loss, smoking cessation, and stress reduction) can have better outcomes. This will include improved physical fitness, less disability, fewer cardiovascular symptoms, less fear and anxiety with more self-confidence, and arguably lower infarction and mortality rates, compared with patients' who do not comply (Randolph, 1985).

However, maintaining modified healthier behaviours may be challenging, especially when it is required of individuals to change behaviours they have been practicing for many

years. There is concern that long-term compliance with lifestyle modifications is low, as patients' are influenced by many surrounding factors and are products of their heredity and environment (Randolph, 1985). As CVD is a multifactorial process, many factors can influence the adoption and maintenance of lifestyle modifications, and compliance may be affected by the type of support that is received by the patient throughout these programmes (Randolph, 1985; Blair, *et al*., 1993). It becomes clear here that the CR programme experienced by the individual can have significant affect on a patient's stimulus to maintain healthy behaviours. This may refer to education available, perceptions of CR and what it has to offer, and the type of support received for each individual within and after the CR programme (Barter-Godfrey, Taket & Rowlands, 2007). It may be difficult for some, to continue maintaining healthy behaviours without continuous or periodic reinforcement (Blair *et al*., 1993). There has, therefore, been concern for more research into basic behavioural mechanisms and the influences that can surround adoption and maintenance of healthy behaviours, to create and enhance more effective interventions (Blair *et al.,* 1993; NICE, 2007).

2. Literature Review

CR programmes in both the UK and NZ are essentially set up to provide preventative measures and treatment for those who are suffering from cardiac diseases (Yusuf *et al*., 2001). They consist of a multi team of qualified professionals, offering a variety of support (Thow, Hinton & Rafferty, 2007). This review will firstly look at the structured CR programmes' guidelines that a patient's experience is based upon; this will indicate the type of lifestyle education that is practiced. It will then investigate the influences that may influence a patient's attempt to maintain healthy lifestyles.

CR Structure and Guidelines

As mentioned in the introduction, NZ practices under the ACSM guidelines. These were first established in the US in the 1960s and were the first recognised formalised CR programmes, which challenged the then current use of bed rest after a CV event (Ades, 2001; Certo, 1985; Sarrafzadegan *et al*., 2008; Wenger, 1973). These programmes are made up of three phases that the patient must undertake in order for them to complete their CR experience. These phases are outlined in Table 2.1.

The rehabilitation workings available in both ACSM (NZ) and BACR (UK) structured programmes, equally aim to provide a multidisciplinary programme which incorporates education counselling, exercise training and treatment in each of their successfully completed programmes (Adams *et al.*, 2008; BHF, 2007b; Thompson & De Bono 1999). Each phase in both models has its own objective for core and progression and has an educational component providing knowledge of CVD disabilities and levels of activity required, essentially incorporating evaluation and treatment in each phase (Certo, 1985). In response to this, it aims to motivate the individuals to make lifestyle adaptations for patients' of high risk or following a CV event or disease (Arnold, Sewell & Singh, 2007; Hughes, Kirk, Mutrie, & MacIntyre, 2002;; Mitchie *et al.,* 2005).

Although the ACSM guidelines provide the same workings as BACR programmes, the structure of the programme differs somewhat. The recognition that CVD individuals need support to alter and maintain their lifestyle behaviours, became apparent in the 1970s, however the focus on greater guidance for maintenance support for these patients',

especially in regards to exercise came a little later (Thow *et al*., 2007). It was in the 1990s that BACR developed a four phase structure for CR. The fourth phase was developed to provide regular exercise sessions, establishing individualised exercise prescription for unsupervised activity, offer general advice and support on maintaining lifestyle changes, and encourage independence and self motivation, with a regular review (Thow *et al.,* 2007). Therefore, as a development of the ACSM guidelines, BACR structured programmes undertaken in the UK consist of four phases. These are outlines in Table 2.1.

Table 2.1 presents a table of each of the structured programmes in NZ and the UK, highlighting the different phases within each.

	Structured Programme used in NZ	**Structured Programme used in UK**
Phase I	The inpatient phase and is the treatment that the patients' undergo immediately after their cardiac event. This involves medical intervention and reassurance, little education, risk factor analysis and planning for further rehabilitation on discharge (SIGN, 2002).	Similar to ACSM phase I, refers to the inpatient phase and is the treatment that the patients' undergo immediately after their cardiac event. This involves medical intervention and reassurance, little education, risk factor analysis and planning for further rehabilitation on discharge (SIGN, 2002).
Phase II	The stage in which the patient is discharged and undergoes hosp/community-based rehabilitation that consists of education, support and a significant exercise component. This may include exercise prescription. This lasts approximately 4-6 months and is supervised (Singh *et al*, 2008).	The stage in which the patient is discharged and undergoes hosp/community-based rehabilitation that consists of education, support and a significant exercise component. This phase focuses on motivating the patient to change and lasts approximately 4-6 weeks (BACR, 2002)
Phase III	The maintenance phase. This phase lasts initially 4-6 months and continues long-term in order to gain lifetime maintenance. This occurs out in the community and requires persistence from the patient themselves to practice the recommendations learnt through the rehabilitation process (Certo, 1985; *Singh et al.,* 2008)	Phase III refers significantly to exercise. This usually includes exercise testing and prescription for a programme which will be completed in a supervised gym environment. This is also assisted with available support and advice on risk factors, education and psychological interventions. This lasts approximately 3-6 months (BACR, 2002; SIGN, 2002).
Phase IV		The maintenance phase. This phase lasts 4-6 months and continues long-term in order to gain lifetime maintenance. This occurs out in the community and requires persistence from the patient themselves to practice the recommendations learnt through the rehabilitation process (Coats *et al.,* 1995).

The phase IV structure is supported by literature on lifetime exercise and aims to provide patients' with a smooth link into the community and leisure centres to encourage further active participation. This approach is supported by the findings of Hughes, Mutri and

MacIntyre (2007), who found that patients' who participated in supervised exercise based rehabilitation (phase IV) had significant improvements in exercise capacity, improving their health and quality of life.

The essentials of CR (lifestyle advice and teachings)

CR programmes have been seen as safe and effective programmes for improving physiological, psychological and social wellbeing and greatly enhancing an individual's quality of life, adjusting common lifestyle determinants such as diet, physical activity, and tobacco consumption (Certo, 1985; Yusuf, *et al.,* 2001). CR is known to have a greater effect on reducing mortality and lengthening life expectancy in both the UK and NZ (Doolan-Noble, Broad, Riddell & North, 2004; Joliffee, *et al.,* 2000). A comparison study of medical interventions supports the initial effect of exercise CR being more significant on the lowering of cardiac mortality rates than any other intervention (Balady, *et al.,* 2000; *Taylor et al.,* 2004). From 1986-1996 there has been an increase of eligible individuals 65yrs + referred to CR programmes from 26.3% - 52.1%. This has signified an increase in life expectancy and highlights the greater awareness of patients' and physicians (Richardson, *et al.,* 2000). It is argued that the reduction in mortality is related to the reduction of the status of disease in response to a multidisciplinary action, which includes lifestyle intervention, risk factor modification and management through exercise and education, and cardio-protective drugs (Singh *et al.*, 2008; Wood, *et al.,* 2008).

Education is an integral part of managing risk factors, along with intervening and modifying patients' lifestyles (Burke, 1999). It is the education that can increase someone's knowledge and understanding of their disease and risk factors, and motivate them to achieve and maintain healthier lifestyles (Burke, 1999). Within CR programmes in both the UK and NZ, presentation and education sessions are usually provided for the patients' after every exercise session in Phase II and, usually last up to six weeks (Dolansky, Moore, & Visousky, 2006).

Risk Factors for CVD are recognised as smoking, inactivity, high cholesterol, high blood pressure, diabetes, stress, and being overweight. The World Health Report (2002) estimated that in developed countries around 12% of all disease burden and over 20% of CVD was due to smoking which can increase the risk of CVD mortality by 60% (BHF,

2008). Statistics related to diet showed that the rate of obesity increased by 5% from 1989-1997 with 35% of energy deriving from fat, including the failure to reach the recommended levels of unsaturated fats in NZ (NHF, 2008). World Health Organisation (WHO) (2002) reported that 30% of CVD was due to fruit and vegetable consumption being below 600g a day (BHF, 2008). It is also argued that people who are active have a lower risk of CVD as research also highlights that 37% of CVD deaths are accounted for by inactivity (BHF, 2007b; Ellis, Grimsley, Goyder, Blank, & Peters, 2007; Lewin, Thompson & Roebuck, 2004). It is also known that high blood pressure directly relates to CVD (BHF, 2008). In agreement, statistics show hypertension accounts for 9% of deaths in NZ (NHF, 2008). Statistics also show that hyperlipidaemia accounts for 6% of deaths in NZ, and those suffering from diabetes is set to rise to 11,100 in 2011 (NHF, 2008). The WHO Report (2002) estimated that around 8% of all CVD in developed countries is caused by raised blood cholesterol, and that over 60% is due to total blood cholesterol levels being in excess of 3.8mmol/l (BHF, 2008). This highlights that as NZ and the UK both present similar lifestyles patterns; it is no surprise that CVD and its risk factors affect the populations of both these countries.

The essentials of CR (Exercise and Education)

After education, another integral part of CR that can initially reverse the effects of inactivity, is exercise. Firstly the individual is educated on the importance of exercise and its recommendations, thus at every stage of CR, exercise sessions are available. Exercise is known to have an extremely beneficial effect on CVD patients' as it can further improve existing risk factors such as; lower blood pressure and body fat; thus reducing hypertension and weight, It can increase levels of HDL and lower LDL; thus lowering cholesterol, it can improve glucose insulin dynamics; thus improving the risk factor of diabetes and it can improve psychological moods; thus reducing the effect of stress (Adams *et al.,* 2008; Thow, Hinton & Rafferty, 2007; Yoshinga *et al.,* 2006).

Exercise is extremely important due to the beneficial effects it can have on the person physically, psychologically and socially (Hillsdon, Foster & Thorogood, 2005). As an effect of this improvement in all aspects of the individual, Singh *et al.,* (2008) support the benefits of exercise, as they found that it enhanced self efficacy, self confidence and self control. Research has also shown that those that take part in leisure activities have a 30-50% risk reduction of CVD (Wannamethee, 2006).

Education is an element that increases knowledge of CVD and its existing influences and is based on a common belief derived from research (Burke, 1999). However, the exercise component is more individualised. This is seen to be important as the National Service Framework (NSF) for CVD suggests the significance of meeting individual needs (Arnold, Sewell & Singh, 2007; NSF, 2007). CR allows for assessment of the needs of the patient and provides support and individualised exercise prescriptions dependant on the individual's functional capacity. It is here the individual is also assessed to ensure psychosocial status and alternatives are not required. This individualisation of programmes even if it mainly just focuses on exercise, is important for the development of the individual to minimise risk and enhance benefits (Morrin, Black, & Reid, 2000; Singh *et al.,* 2008). The comprehensive and individualised exercise programme will primarily have short term goals; to control symptoms, educate and decrease the risk of further CV events and long term goals; to modify risk factors, maintain healthy behaviours, improve psychological status and initially improve quality of life (Kavanagh, 2000; Singh *et al.,* 2008).

Multifactorial CR programmes therefore support and encourage change and help people set realistic and achievable goals to restore their health and return to ordinary life (BHF, 2007a; Singh *et al.,* 2008). They are set to increase exercise tolerance and psychosocial wellbeing without risk of complications to enable patients' to acquire and maintain functional independence and return to appropriate functioning in their surrounding society (Singh *et al.,* 2008). It is therefore essential that exercise and education are adequate and successful in increasing knowledge and understanding, motivating the individual to change to healthier diets, practicing stress reducing techniques and instilling a sense of control into the patient (Burke, 1999). According to Burke (1999), CR should then be successful at reducing many risk factors. This could initially improve lifestyles, reduce hospital admissions and improve the quality of life (BHF, 2007b). However, no one factor is thought to be better at reducing mortality, it is the interaction and adherence of all components of the CR multifactorial interventions that will produce the most successful outcome for the patients' (Singh *et al.*, 2008; Wood *et al.*, 2008).

CR and lifestyle modification adoption and maintenance

CR aims to address the individual physically and psychologically in their environment in an attempt to firstly modify ones behaviour and more importantly maintain the newly learned behaviour. The Nurses Health study and The Health Professionals Follow-Up Study

showed that there was a 62-80% reduction of CVD events with people who maintain healthy lifestyles for more than 16+ years (King, Mainous, Canemolla & Everett, 2009). The importance of changing lifestyles is a common phenomenon and it must be acknowledged that it is never too late. Recent studies have shown that even middle aged adults, who switch to healthier lifestyles after 45yrs, can reduce CVD events by a significant 35% in only 4yrs (King *et al.,* 2009, AHA, 2010). Adherence to healthy lifestyles is a great indicator for public health and a key predictor for future health trends and economic costs. Therefore, the importance of maintaining behaviour cannot be stressed enough (King *et al.,* 2009).

Although existing adherence patterns differ between those who adhere to intervention programmes and those who adhere to maintaining lifestyle changes, supporting research suggests that those who participate in any CR education programmes increase the likelihood of long-term compliance with healthy lifestyles, than those with no CR at all (Burke, 1999; Williams *et al.,* 2006). It is not a recent phenomenon that reducing risk factors, modifying behaviours and maintaining healthy lifestyles is essential to a patient's wellbeing (Randolph, 1985). Although this is understandable, there is further concern with the success of maintenance for those individuals who have completed a CR programme in maintaining healthy lifestyles (Barter-Godfrey, Taket & Rowlands, 2007; Burke, 1999; Midlov, *et al.,* 2008; Norris, 2003). Ornish, Scherwitz, Billings, & Gould (1998), found that maintaining and changing lifestyles was extremely difficult. This seems to be a common problem both in the UK and NZ, as even though research promotes interventions for changing lifestyles, participation rates are still low (Dalal *et al.,* 2007). In 2000 only 3% of adults adhered to 4 healthy lifestyle characteristics (King *et al.,* 2009). When looking at exercise alone, with only 10% attempting to adopt exercise, half of them will drop out within 3-6 months (Barter-Godfrey, Taket & Rowlands, 2007; King & Martin, 1993).

There is little known about those who drop out of exercise schemes (Sorensen, Skougaord, & Puggaard 2006). It seems that adherence to lifestyle factors is less than that of medication, maybe due to the increase in effort required to maintain healthy lifestyles (Mochari, Ferris, Adigopula, Henry & Mosca, 2007). A study completed by King *et al.,* (2009), found that adherence to healthy lifestyles has decreased in the last 18yrs from 15-8%. This is a similar trend when looking at the individual risk factors for CVD. Statistics show that only 37% of men and 24% of women successfully complete the recommended

exercise guidelines in the UK (BHF, 2007b). Many patients' do not continue an active lifestyle following phase III (Hughes *et al.,* 2002), only 57% of men and 48% of women successfully complete the recommended exercise guidelines in NZ (MoH, 2004). Only 20% of age 35-49 and 36% of age 50-59 successfully gave up smoking in 2001 in the UK (BHF, 2002), only 26% men and 21% women successfully have given up smoking in NZ (MoH, 2004). 60% of men and 49% of women are overweight or obese in NZ (MoH, 2004). Although differences exist between the two countries it is clear to see with these few statistics that there is still a significant amount of educated individuals that still fail to maintain healthy heart behaviours in two countries that are similarly affected by diseases associated with lifestyles. Even though education is thought to be sufficient to improve adherence, there appears to be a lack of understanding on the importance of lifestyle recommendations (Midlov, *et al.,* 2008). A study completed by Dugmore *et al.,* (1999), found that regular activity improves cardiorespiratory fitness, psychological status and quality of life and therefore, preparation is needed for breaks in activity levels (King & Martin, 1993)

Barriers to CR, lifestyle adoption and maintenance

As previously mentioned, the benefits that are gained from maintaining what is learnt throughout the CR experience can be predictive of the future health status and quality of life of that individual (King *et al.,* 2009). However, these simple statements overlook the multiple influences, that the individual may experience when attempting to adopt and maintain a new behaviour. CR aims to address the individual physically and psychologically in their environment in an attempt to firstly modify behaviour and more importantly maintain it. It is recognised that there is a need to go beyond specialist CR services and provide local preventative cardiology programmes, adapted to medical cultural and economic setting of that country (Wood *et al.,* 2008). Research acknowledges that many surrounding factors such as demographic factors, external factors (e.g. institutional, economic, social and cultural) and internal factors (e.g. motivation, pro-environmental knowledge, awareness, values, attitudes, emotion, locus of control, responsibilities and priorities) can influence behaviour *(*Kollmuss & Agyeman, 2002).

Maintenance of healthy lifestyles and influencing external factors

CR and the individual cannot control external factors that can influence an individual maintaining certain behaviour. These factors are recognised as those also linked to CVD, such as age, ethnicity, gender, socio-economic status and demographics and more significant in NZ; health insurance (Barter-Godfrey, Taket & Rowlands, 2007; Mochari, Ferris, Adigopula, Henry & Mosca, 2007; Midlov, *et al.,* 2008). The demographics of the UK are similar to that of NZ and have effect not only on CVD prevalence but also can affect the ability to adopt and maintain healthier lifestyles (Norris, 2003). This is evident with Maori mortality rates of CVD are three times higher than non-Maori (Bramley, *et al.,* 2004). Patients' of certain demographics have more opportunity for CR benefits (Singh *et al.,* 2008). Studies have shown that the Maori population in 1996-1999, revealed higher prevalent risk factors, lower economic status, higher unemployment, and lower referrals and participation rates in CR (Bramley, *et al.*, 2004). Much like NZ, those who live in certain areas of the UK, such as the Wirral, who experience higher deprivation, unemployment, lower economic status, lower education, also experience more prevalent risk factors, such as physical inactivity, poor diet, smoking, poorer physical fitness and have a 50% increased risk of developing CVD and reduced chance of undertaking CR programmes (Hutton, Beale, Kruger & Chaplin, 2008; Myrtek, Keiser, Raunch & Janson, 1997).

Although CR is seen to be a beneficial and essential intervention for those with CV problems, there are problems that exist within the service with low referral rates in both the UK and NZ (Dalal & Evans, 2003; Doolan-Noble, Broad, Riddell & North, 2004). An inconsistent approach to referral of patients' to CR programmes (King, Human & Teo, 1999) diminishes the effectiveness of CR as an intervention (Cortes & Arthur, 2006). The above factors could initially have direct effects on finances and cultural constraints, access, transport and opportunity, which could initially also affect the process of adoption and maintenance of healthier lifestyles (Doolan-Noble, *et al.,* 2004; Melville, Packham, Brown, Weston & Gray.1999; Norris, 2003).

Every patient who undergoes CR, receives lifestyle education and intervention, and until now this has seemed sufficient (Bundy, 2004). However, it is factors that lie within the individual and current society that later determine whether they maintain healthy heart lifestyles. As we know CVD are multifactorial diseases and as research shows, the treatment of lifestyle intervention and success of maintenance also has a multifactor

influence. For example (as previously mentioned) WHO (2002) reported that 30% of diagnosed CVD was due to fruit and vegetables consumption being below 600g a day. As a result of much research, CR programmes give education on healthy heart diets relating to reducing body weight and increasing nutritional wellbeing. This includes 5 portions of fruit and vegetables a day, as well as lots of recommended diet advice, which is relayed to the patients'. In theory this is very simple but this recommendation fails to address factors that initially effect diet consumption alone. BHF (2007b) heart statistics recognise that diet consumption alone is influenced not only by factors external to the individual such as commercial promotion, composition and price, but also direct factors such as age, income, knowledge and attitude. It is clear to see here that by focusing on overweight and diet relations to CVD, (only 1 of many known risk factors in the development of CVD), the complexity of not only the disease itself, but also the factors needed to be considered in the simple attempt to intervene and maintain only one lifestyle recommendation, becomes clear, let alone an attempt to modify multiple factors.

The factors that are directly related to the individual themselves also include people that exist in their environment. Families' and friends' support, can influence and affect maintenance of lifestyles especially when unhealthy lifestyles including diets are also practiced by household members (Barter-Godfrey, Taket & Rowlands, 2007; King & Martin, 1993). Families can also affect healthy lifestyles when an increase in responsibility requires time and commitment from the individual with CVD. They can also add additional stress which as well as being a risk factor for CVD, can also affect maintenance of lifestyles (Mochari *et al.,* 2007). Stress can increase things such as uptake of an unhealthy diet, increased alcohol consumption and induce a perceived lack of time for things such as exercise (Mochari *et al.,* 2007).

Maintenance of healthy lifestyles and influencing internal factors

Personal factors that are within a person's control are those that initially determine the personal behaviour adoption and maintenance of that individual. CR aims to address the personality factors of the individual, motivating them to change by increasing their awareness and knowledge, altering their attitudes and priorities, and guiding them to take control of their own health (Burke, 1999; Mochari *et al.,* 2007). It is also important to note that some may even find it easy to change their lifestyle, but maintenance is another challenge, as the individual could relapse at any time as there is always potential for non-

adherence regardless of the patient or setting (Burke, 1999). This is extremely important as changing and maintaining any behaviour relies on the interaction between the mind and body (Kubansky, Kawachi, & Weiss (1998). This interaction makes the mind a very strong determinant in any physical behaviour change. A study done by Sanderson and Bitner (2005) highlights the importance of the interaction between the mind, physiology and behaviour, as they found a relationship between depression, obesity and dropout rates. Here, it is important to note the significance of depression in post myocardial infarction (MI) patients', which must be assessed, as clinical depression was found in 40-65% of post MI patients' (Singh *et al.,* 2008), and this can influence change in behaviour (Sanderson & Bittner, 2005).

This is clear when factors such as motivation and self efficacy have been clearly linked with the adoption of new behaviours (King, Human, Smith, Phang & Teo, 2001). Research highlighted that patients' own perceptions influenced by their own experiences can inevitably affect the outlook of maintenance of behaviours (King & Martin, 1993). Self beliefs and perceptions can determine maintenance of any behaviour, if people believe they cannot succeed they are more likely to relapse, those who have a perception of having no time to exercise, are less likely to maintain regular exercise (Mochari *et al.,* 2007). Levels of perceived support in CR are also likely to affect maintenance and have been seen to increase one's self confidence and motivation to maintain healthy lifestyles (Barter-Godfrey, Taket & Rowlands, 2007; Luszczynska & Sutton, 2006).

Patients' experience in CR and maintenance of healthy lifestyles

It is clear that personal experiences leading up to CVD can affect behaviour when looking at some prevalent CVD environments. This influence of personal experiences also indicates that the experience the patient goes through during and after CR can also affect maintenance levels of healthy lifestyle. Studies have shown that experiences can significantly affect psychological factors of the individual such as perceptions, confidence and motivation, which directly determine behaviour adoption (King & Martin, 1993; Mochari *et al.,* 2007). The patient's experience of CR is set to educate and alter their mind, to motivate them to make essential changes to their lifestyle, and inevitably has the potential for improving patient adherence to healthy lifestyles (Burke, 1999; Mochari *et al.*, 2007). However, Egan, (1999) found that increased knowledge is not shown to significantly influence behaviour change. Despite this, increased knowledge allows the patient to

become more involved in their own treatment, thus improving their perception of control and better quality of life (Goble & Worcester, 1999).

Although education is thought to be an integral part of an individual's behaviour, education available in CR is tailored for reducing common lifestyle factors that may affect the patient's disease status (Burke, 1999). The word 'common' indicates that there may be other influences that initially could affect the individual's maintenance success and disease status outside the common range, that are overlooked. Miller, Sales, Kopjar, Fitin and Bryson (2005) support this suggestion as they recognise that research in this area on influences of behaviour is lacking. Therefore, it is impossible to identify and address all factors that may be affected in the modification and maintenance of lifestyle changes, especially if they do not affect all persons and are unknown. This is extremely important, as the educational experience of the individual can be a factor that may affect maintenance of behaviour. This includes the general factors involved within the individual: such as level of understanding, literacy levels, vocabulary level, time frame for learning, and factors involved in the delivery of education itself (Barter-Godfrey, Taket & Rowlands, 2007; Burke, 1999)

All the factors mentioned above by Kollmuss and Agyeman (2002), can act as barriers on behaviour maintenance and lie heavily on the patient's experience itself. Cooper, Lloyd, Weinman, & Jackson (1999), found that patients' beliefs were influenced by the patients' experience of the CVD diagnostic process and can be further advanced by factors such as knowledge, media, family etc. It is therefore the patient's experience that may strongly influence attitude, perceptions and behaviour (Kollmuss & Agyeman, 2002). King and Martin (1999), found that experiences with exercise and knowledge can affect beliefs and initially affects how active a person can become. Along with patients' beliefs, self motivation and self efficacy can influence and be influenced by a patient's experience, which can in turn influence the maintenance of healthy behaviour (King *et al.,* 2007).

As complex as the disease process of CVD is, it is also recognised that the preventative and treatment process intended is also extremely complex. Chawla (1998), recognises that it is not a single experience that influences behaviour but more so a combination. If when looking at experience we relate to all the patients' experiences before, within and

after CR, we can be looking at a number of influences. As mentioned previously, levels of perceived support within CR and after are also likely to affect maintenance and have been seen to increase one's self confidence and motivation to maintain healthy lifestyles (Barter-Godfrey, Taket & Rowlands, 2007; Luszczynska and Sutton, 2006). Maintenance of healthy behaviour is therefore directly relevant to the personal affect these experiences have on the patient psychologically and physically.

Summary

CR has been found to be necessary for providing patients' with adequate advice required for addressing the individual in their environment, concerning cardiac conditions and treatment, modifying lifestyle patterns, as well as improving the hemo-dynamic condition of the individual, enabling them to return to a working environment (Myrtek *et al.,* 1997). However, interventions designed for health advice that fail to address these personal, social and environmental constraints are unlikely to succeed in accomplishing the individual to adopt and maintain healthy lifestyles (McNiell, Kevter & Subcamanian, 2006). These interventions should therefore educate the individual of healthy changes that could be made, relevant to what is available in their environment, to ensure maintenance success (Barter-Godfrey, Taket & Rowlands, 2007)

The concern with the CR process needs to focus on the individual's adherence and maintenance to what they have learnt in CR. The significance of this is highlighted in the suggestion that the lower rates of adherence to preventative regimes such as CR secondary prevention programme and medication compliance, may actually contribute to higher CVD rates (King *et al.,* 2009; Mochari *et al.,* 2007).

This research study will focus on the modifications that are thought to be achieved and maintained as a result of CR in both the UK and NZ. This will entail an assessment of how effective former CR patients' experiences within and after the programme, have been at successfully improving and maintaining lifestyles and improving their quality of life in each country. As patients' experiences largely affect perceptions and behaviour, there is a need for further awareness on the effects that patients' experiences may have on maintaining healthy lifestyles. Identifying indicators of adherence could provide us with key information to improve preventative care (Mochari *et al.*, 2007).

Comparing both countries may indicate those things that work well in CR and those that are problematic. Differences found between the two countries may highlight the most effective methods used in both countries to support the maintenance of adopted healthy heart lifestyles, in identifying the most appropriate strategies for maintaining lifestyle change (NICE 2007). Exploring patients' views and experiences suggest further development of care programmes especially the individualised care aspect of the programme, as there may be need for a more supported maintenance programme (Singh *et al.,* 2008). This may suggest areas of improvements that both countries could benefit from to provide patients' with greater support. With this comparison, proposals for further research into improving services in each country may be possible.

2.1 Literature Review of Methodology

Choice of method

Assessment of patients' experiences usually provides information in the form of descriptive words which is significant to them only. This type of data required to assess such experiences is known as qualitative data, and can be used to assess an individual's interpretation and understanding of their own world including actions, decisions, behaviour, beliefs and values within their social world (Ritchie & Lewis, 2006). The use of qualitative data is a recent phenomenon, which is continually developing and gaining respect, being used more frequently in significant studies (Morse & Field, 1995). Ritchie and Lewis (2003) recognise that all knowledge about the world and behaviour originates from our own experiences and is determined through our senses. As CVD is a multi factorial disease with influences that begin with traits within the individual, and within social and environmental surroundings, it is sufficient to use qualitative data when attempting to understand and interpret the individual's central motives to maintaining healthy behaviours (Ritchie & Lewis, 2006). Considerations in using qualitative data refer to the patients' and researcher's time, access and resources. The three main methods for collecting qualitative data include Interviews, Focus Groups and Observations.

Interviews

Interviews can be used to collect qualitative and quantitative data depending on how structured they are. Structured interviews usually consist of a predetermined set of

questions that are aimed to be answered in detail during the interview process. The more structured an interview the more quantitative the data will be; producing results such as statistics. Unstructured Interviews tend to have a set of topics that may want to be discussed, but initial questions are less specific. A more flexible structure enables more room for detail and personal experience, allowing participants to express their thoughts more freely providing more qualitative data (Morse & Field, 1995; Powell & Single, 1996; Tod, 2006). However, the patient's initial connection and relationship with the researcher can affect the amount of disclosure from the interviewees in regards to honesty, amount and quality of the data collected (Denscombe, 2003). Interviews are an effective, flexible and efficient way of collecting data, however for the researcher, interviews can be extremely labour intensive, time consuming and expensive (Denscombe, 2003).

Focus Groups

Focus groups are a method of unstructured interviewing which involves more than one participant (Bryman, 2004). These were initially used as a way of obtaining information on marketing matters (Kruegar & Casey, 2000). However, similar to Morgan and Spanish's (1985) study, it was believed focus groups were a good method to assess how people organise knowledge about health issues. They can provide an opportunity for reflection and refinement which can deepen participants' insights into their own circumstances, attitudes or behaviours. It is believed that focus groups are a good way to assess attitudes, beliefs and experiences as it is clear that perceptions and attitudes are not developed in isolation but through interaction with other people and surroundings (Morse & Field, 1995). Therefore, discussing things with others can be closely related to the reality of everyday life, due to the influence that interactions in their environment have on attitudes, behaviours and the way in which meaning is constructed. It can therefore explore why people feel and act the way they do, in their individual situations (Bryman, 2004).

Focus groups usually consist of 6-10 participants (Bryman, 2004; Finch & Lewis, 2006; Morgan, 1998; Morse & Field, 1995). Groups less than 6 could lack interaction and discussion, whereas groups larger than 9 can prove to bring out more dominant characters thus lack involvement from less vocal participants (Bryman, 2004; Finch and Lewis, 2006). The qualitative data generated through focus groups of 6-10 participants provides most sufficient and useful discussion data (Bryman, 2004; Morgan, 1998). Although this can be largely subjective, it can offer a broader depth of research and lead to greater understanding (Miles & Huberman, 1994).

Focussing on assessing individual experiences on how effective CR had been for them in maintaining lifestyle modifications and improving their quality of life, can be investigated through generating this type of qualitative data (Ritchie & Lewis, 2003). Focus groups have been used by health services for a number of reasons to provide them with information about the service, to make future changes and to meet the demands of providing for the people. This has recently been used within the Wirral to meet the aims of the Primary Care Trust (PCT), giving people a voice and freedom of expression and choice. This is the newly developed aim for patient and public involvement and can answer research questions; it also improves morale and self worth of its participants (NHS Wirral, 2010). It also demonstrates that the service providers are listening to their users (Powell & Single, 1996). As CVD is a largely complex disease, as are the influences affecting treatment, adoption and maintenance of lifestyles, it was thought more effective to assess the participants in a more naturalistic influencing environment. Using this method of data collection can enable the participants to engage with each other about their experiences, triggering additional responses and initiating others to reveal more (Finch and Lewis, 2006; Powell & Single, 1996). The interaction between participants as an individual and a group can initiate further insights into individual's behaviour and how people are shaped through conversation with others (Finch and Lewis, 2006). Exploring patients' views and preferences is therefore considered a valid method of assessing the value of healthcare, thus initiating future developments (NICE, 2007).

Observations

Observations can be used to collect data and provide greater understanding (Cooper, 2004). An observer can act as a participant or a non-participant observer. When acting as a participant, they can influence the other participants involved in the situation. Observing as a non-participant allows the observer to get a full understanding of the experiences of the people that they are observing. This method of data collection is frequently used when assessing services. The NHS provides frontline staff to observe areas of different services in the UK. This allows the observer to look in from the outside, keeping an open mind and viewing many different aspects of the situation. The non-participant observer can then accumulate their own view of the experiences observed without influencing the situation themselves. This is known as 'reflecting in action'. The data collected can then be used as feedback to compare services and make future improvements. Reflecting in action used in health care, involves talking with patients' and professionals, highlighting any similarities

and differences between the way in which similar programmes are run and experiences of the participants (Schon, 1991). It is important to note that although it allowed for exploration in the meaning of the experiences in regards to the participants, these findings are subjective of the researcher's perceptions and experiences within the programme; however it does leave scope for creativity and development through any given feedback (Schon, 1991)

3. Method

Ethical approval was granted from both the University of Chester and the National Ethical Committee in NZ in order to complete this study. The study utilised two methods for collecting data; observations and focus groups. This qualitative approach had the benefit of gaining more of an insight into the service that the participants had experienced. It also gave insight to the learning of adherence in regards to behaviour and allowed for a better understanding of participants experiences, feelings and knowledge (Donker, 2000).

Participant recruitment

The study aimed to recruit 20-25 people in both the UK and NZ. These participants had to be discharged from CR at least 6-12+ months previous in order to assess elements surrounding their maintenance of healthy lifestyles as they would be now experiencing the maintenance phase of CR. The maintenance stage that was applicable to all the participants, referred to phase III in NZ and phase IV in the UK.

Participants were recruited from the following two institutions:

- NZ- Massey Cardiac Clinic, Wellington: *This provides patient progression through exercise phase II and onto phase III of CR. These patients' have undergone Phase I and II (education) at Wellington and Wakefield Hospital. The clinic provides the opportunity to continue and maintain exercise by attending the available 3 weekly sessions. This service was founded for student future research and is individually funded.*
- UK- Wirral Heart Beat, Wirral: *This provides patient progression through phase IV of CR. These patients' have undergone phase I, II and III (education and exercise) at Wirral Heart Support Centre,, St Catherine's Hospital. This service is supported by the NHS to encourage life long exercise, established and maintained by a charity called Wirral Heart Beat, and is individually funded. These are known on the Wirral as Fire station gyms.*

All participants were recruited in a similar way with the help of the two above organisations. It was decided to gather participants with the help of these organisations as

attaching data collection with an individual or organisation could improve the response rate (Murphy-Black, 2006). All participants were provided with information sheets (see appendix A) and consent forms (see appendix B and C). The consent forms differed between countries due to the regulations which must be followed in NZ with reference to Pakeha (Western New Zealanders) and Maori people (original heritage of NZ settlers). All participants were also provided with a list of topics that were to be discussed in the focus groups. The participants were then given at least a week before taking part in the study.

Data collection

Observations:

- The researcher initially observed the programmes provided by both institutions over a period of 2 months.
- This enabled the researcher to also comment on findings that were related to the theory 'Reflecting in Action', so they knew what service patients' had experienced.
- Notes were made, which will be reported on in the later sections of this study.

Focus groups:

- This consisted of groups of 6-10 participants.
- Each discussion group took part in a quiet room at the two institutions, in order to minimise any problems with access and convenience.
- Participants were provided with refreshments.
- Just prior to the discussion taking place, consent forms and a verbal explanation of the study for all participants, was completed.
- Discussions followed a schedule of topics and questions as given in appendix D

Data Analysis

Discussions between the former CR patients' were digitally recorded in which they were then transcribed in order to generate data to support the literary findings. Information derived from these discussions and transcripts, were then narratively analysed by Thematic analysis. This can be defined as a process for encoding qualitative information

and is usually done so by highlighting a number of themes. These themes can then be explored to highlight any patterns (Boyatzis, 1998). This can focus on exactly what was said within these focus groups, emphasising the connections in the individuals past, present and future events, and states of affairs in relation to their CR experience (Bryman, 2004). This highlighted themes, phrases or patterns that existed within the participants, between the focus groups and between the UK and NZ in regards to maintaining healthy lifestyles.

Confidentiality

The data was collected anonymously, and pseudonyms were used to ensure confidentiality. Names and addresses obtained in NZ were destroyed through the department once letters had been issued and no longer required.

4. Results

The study recruited 21 participants from NZ and 22 from the UK. The nature of the groups was similar and all fitted the given criteria. The characteristics of the groups are presented in Table 4.1.

Table 4.1 to show the group characteristics

	Group 1 NZ	**Group 2 NZ**	**Group 3 NZ**	**Group 1 UK**	**Group 2 UK**	**Group 3 UK**
Number of participants	6	6	9	8	7	7
Number of Male and Females	6M	5M 1F	5M 4F	7M 1F	5M 2F	4M 3F
Ethnic origin	1 Oriental 1 Asian 4Caucasian	5Caucasian 1 Oriental	Caucasian	Caucasian	Caucasian 1 Oriental	Caucasian

Conclusions were drawn using findings from the focus groups and observations collected in the form of reflective research.

Observations using Reflection-in action

Observing how the clinics run and the process the patients' undergo, enabled great insight into the background of the patients' experience, who took part in the discussion groups. It enabled for perceptions, similarities and differences to be identified, within the interpretation of the observer, but it also enabled exploration in the meaning of the experiences of the patients', which in turn revealed more details on the factors that affected maintenance of their healthy lifestyles post CR (Schon, 1991). The additional information collected through reflective observation could be used for future developments.

The results derived from the observations confirmed that the services were very similar in what they offered the patients' in terms of education and exercise. The patients' experience of the CR service, were also very similar between both countries. In the UK the educational sessions include topics such as: Healthy Heart, Risk Factors, Physical Activity, Nutrition (usually done by a dietician), Pharmacy (usually done by a pharmacist) and

Stress. In NZ the educational topics differ somewhat and include: Cardiac Rehabilitation and Risk Factors, Psychological aspects of Heart problems, Exercise, Stress and Relaxation, Nutrition and Shopping and Labelling. By looking at both of the educational programmes, each are very similar in what they include such as nutrition and diet, stress, exercise and the general understanding of the disease and risk factors. However, it is clear that NZ differ in educating their individuals in less depth than the UK, about their disease, risk factors and their medication. However, NZ give more of an insight and support on the practicalities of shopping healthily for these individuals and also about the psychological effects of CVD. Observations using refection in action that were directly related to the maintenance of healthy behaviours in the participants that took part in the discussion groups, will be commented on later in this study.

Thematic Analysis

Using thematic analysis, the transcribed data highlighted many re-occurring themes and patterns that existed within the groups' discussions. Themes relevant to the changing and maintenance of healthy behaviour were highlighted and commented on within each transcript. This was then collected and within each group, a brief description of the group as a whole, and individuals were commented on respective of the observer's reflections of the individuals in the group. The themes relevant to changing and maintaining healthy behaviour were then commented on under the headings and topics that the discussions focused on were written as a summary (see appendix E.1-6). This included topics such as nutrition/diet, exercise, smoking, medication, diabetes, stress, overall (including improvements for the future). In this section the results will now be addressed referring to the key topics which were discussed and that make up the CR programme.

Using Thematic Analysis

The data collected through thematic analysis was then collated within tables for each heading, highlighting the themes that were common within and across both countries. This exemplified those factors that may have a significant effect on maintaining healthy behaviour and is illustrated in Table 4.2 - 4.5.

Table 4.2 show themes highlighted in each discussion group with regards to Nutrition, across both countries, in relation to maintaining healthy lifestyles post CR

Maintenance of behaviours	GP1-NZ	GP2-NZ	GP3-NZ	GP1-UK	GP2-UK	GP3-UK
Nutrition						
Biggest element changed	*	*		*	*	*
Education	*	*	*	*	*	*
Increased Knowledge	*	*	*	*	*	*
Increased understanding	*	*	*	*	*	*
Take more notice	*					
Media	*	*	*	*		
Faith in advice	*				*	
Confidence	*				*	
Environment	*					
Food offers	*					
Cost	*			*		
Family Members +/-	*	*	*	*	*	*
Support (family, friends)	*	*	*	*	*	*
Portion control	*	*	*	*		*
Commercial (Promo)	*	*		*		
Marketing	*	*	*	*		
Budgets (income)	*					
Taste (likes & dislike)	*			*	*	
Temptations (Fast food options)	*	*	*	*	*	*
Changing food of family	*	*				*
Motivation		*			*	*
Lonely (MOT)		*				
Enjoyment		*	*			
Culture of society		*	*	*		
Self Control		*		*	*	*
Read the labels (More care shopping)			*	*	*	*
Healthier choices	*	*	*	*	*	
Holidays			*			*
Routines			*	*		
Conscious effort			*			
Time constraints				*		
Upbringing				*		
Moderation	*	*	*	*	*	*
Lack of acceptance					*	
Perceptions					*	
Experiences					*	
Conflicting views & advice	*	*	*	*	*	
Diabetes		*		*		*
Mental attitude	*	*		*	*	*

NB: Highlighted within this table are the factors that are common within NZ (green), within UK (blue) and across both countries (yellow).

In both the UK and NZ, the general consensus in regards to diet and nutrition was that dietary changes were the biggest element modified to enable a healthier lifestyle. Components of diets, and more so eating habits, have changed in response to the CR programmes experienced by the participants. Salt, sugar and fat contents were reduced within most peoples' diets and fruit and vegetable intake increased. This was more significant to the participants in the UK, changing diets by way of using healthier cooking methods in food preparation. Within both countries, this has been due to the increase in education, knowledge and understanding which in turn has motivated them towards practicing healthier lifestyles in relation to nutrition and diet. This was evident as within all discussions, it was mentioned that with increased knowledge, more care was taken with shopping, and many now read the labels to help with making healthier food choices. Many mentioned understanding and practicing the aspect of moderation.

Aspects that also seem to affect healthy diet maintenance within the UK and NZ were also influenced by family members' dietary intake and desires and, were affected by how supportive family members were within this element. This is highlighted by a quote from a NZ participant '*family of 4, I found that unless the 4 made changes, the 1 wasn't going to maintain'.* This included the individual's ability to understand and have good portion control, also for family members who prepare the food, and to have an ability to provide the individual with sufficient size portions.

Factors that seem to have more of a detrimental effect on healthier lifestyles and diet consumption, in both the UK and NZ, are aspects such as temptations; whether this is what's provided in the cupboards of the house, fast food options, or supermarket offers and also, the conflicting advice, and constantly changing recommendations of dietary information. This was evident when a NZ participant mentioned that he still fought with temptations.

There was a more significant mention of the commercial sector within NZ, with aspects such as the media and food marketing perceived as actually affecting healthy dietary maintenance. One participant stated '*Well were marketed, were marketed to this stage'.* Whereas UK participants significantly mention the influence of self control on food consumption in order to overcome these wider determinants of influences. Both within the

UK and NZ the participants' felt that a major factor for maintaining healthy diets was mental attitude; it was then general consensus that it is this that would affect healthy behaviour maintenance. This can be clearly seen in responses from two participants from NZ. In response to talking about how hard or easy it was to make healthier changes, the response was '*I was so thankful to be alive anything was easy'.* This is later followed by *'Its only about 15% of keeping our self's alive, 85% is mental attitude. WE HAVE TO WANT TO LIVE'*.

Exercise

Along with diet, adopting and maintaining exercise was also the biggest change to healthier lifestyles in response to their CR experience in both the UK and NZ. The participants felt they exercised more now then they ever did before CR or at least maintained their previous level. A participant from the UK stated when asked about previous exercise *'I never carried it on, but I didn't think I needed exercise*.' (He now attends the gym 3 times a week). The participants attend structured exercise sessions 2-3 times a week and tended to walk more outside of the sessions. Walking outside the sessions seemed to be more significant in the UK, as one group in NZ felt that the three times structured exercise sessions were sufficient to maintain their health. All groups mentioned that having a dog was a good incentive to get out walking, influencing their activity levels and maintenance.

The biggest influence for maintaining exercise within both the UK and NZ was the environment in which exercise was completed. This is evident in the following selected quotes taken from some of the discussion groups when talking about the reasons why they exercise in the places they do and not bigger commercial gyms: '*Its more friendly, Its not intimidating', 'part of it mostly is the social interaction', 'the action of coming in and doing the exercise here is quite a good thing cause its companionship'* and '*we've got a common friend which is our heart'.* It seemed extremely important that this environment was safe, friendly and consisted of people they could relate to. This is evident when a participant in the UK referred to the gym as more of a '*therapy centre'*, and continued with *'people understand what you've gone through because they've been through similar things'*. This environment was provided for them in the sessions, and they felt they would not exercise if this was not the case. This highlights the significance of a social element for maintaining exercise.

Table 4.3 show themes highlighted in each discussion group with regards to exercise, across both countries, in relation to maintaining healthy lifestyles post CR

Maintenance of behaviours	GP1-NZ	GP2-NZ	GP3-NZ	GP1-UK	GP2-UK	GP3-UK
Exercise						
Biggest element changed	*	*	*	*	*	
Social	*	*	*	*	*	*
Environment	*	*	*	*	*	*
Friendly environment	*	*	*	*	*	*
Safe environment	*	*	*	*	*	*
People they can relate to	*	*	*	*	*	*
Family Members	*	*	*	*		
Support company (family, friends, professionals)	*	*		*	*	
Goals		*	*	*		
Encouragement	*	*	*	*	*	*
Feel better physically			*	*	*	*
Feel better mentally			*	*	*	*
Priority			*	*		
Fitness	*			*		
Motivation	*	*	*	*	*	*
Lonely (MOT)	*					
Enjoyment		*	*	*	*	*
Culture of society			*			
Self Confidence				*	*	
Self esteem/efficacy				*	*	
Physical ability/disabilities	*		*		*	*
Holidays						
Routines		*		*		*
Conscious effort (energy)	*				*	
Time constraints/convenience	*	*	*	*	*	
Education	*	*	*		*	
Weather	*	*	*		*	*
Acceptance	*				*	
Perceptions	*	*	*		*	
Experiences						*
Incentives		*	*		*	*
Exercise outside the gym (walk, cycle...)	*			*	*	*
Mental attitude		*	*	*	*	
Cost				*	*	*
Illness						*
Dogs		*	*		*	*
Bad feelings if miss					*	*
Part of life	*	*	*	*	*	*
Access	*	*				
Opportunity	*	*	*			
Work	*	*	*		*	
Stress		*				

NB: Highlighted within this table are the factors that are common within NZ (green), within UK (blue) and across both countries (yellow).

Other aspects significant both in the UK and NZ were the elements of support and encouragement. Support, encouragement and incentives from professionals, family and friends could motivate the individuals to maintain an exercising element in their healthy lifestyle. One participant from NZ said '*you have to have the right encouragement; the course here needs to develop'.* The importance of support is evident in the following quotes from each country, with them speaking, extremely highly of the CR experience and professional support they had:

- UK: '*St Caths is a great place to be, for what they do, I think their brilliant absolutely brilliant"*
- NZ: *'if it hadn't been for Jacques and the rest of the team, I probably wouldn't be sitting here right now'…* '*they were supportive, so that made it easier, much much easier'.*

As with diet, mental attitude could affect exercise maintenance. It is pointed out by a participant in the UK, that to overcome this, you have to make exercise a priority; it must become part of your routine. He said when talking about the convenience of driving, '*I now think feet before wheels*'. As well as, motivation and also enjoyment, influences by many factors could determine exercise behaviour and maintenance.

Factors such as physical disabilities, arthritis or illness, were mentioned to have a detrimental effect on maintaining exercise. This is evident when a participant stated when talking about doing exercise outside of the sessions, *'not if your legs won't do it'.* Another participant clearly stated when asked what would stop her exercising; she replied '*illness would stop me'.* Aspects that were most significant across both countries in regards to exercise were time constraints and weather. Weather influenced whether participants would exercise outside of the structured indoor sessions. This is evident when a participant from the UK stated '*I go for a walk once a week with my wife on Tuesday and we will increase it when the weather gets warmer'*. A participant from NZ agreed when she said *'I want to be a better walker and maybe dear god if the weather improved'.* Perceived time constraints and perceived convenience were also mentioned to influence maintenance of exercise levels.

Within the UK, the feeling that exercising made them feel better mentally and physically was more significantly mentioned within discussions, motivating them to maintain this healthy behaviour. This is highlighted in the following quote from a UK participant *'er certainly there's no doubt that it has improved, I mean I'm better, more active, more motivated, especially on the days I come here, but the improvement would be somehow or other giving me more incentive'.* In NZ however, the individual more significantly mentioned the influence of education on their motivation levels. They also mentioned the influences of family members on exercise levels and maintenance and also the constraints of work and actually having the opportunity to complete exercise. They also felt driven by their perceptions. However, both in the UK and NZ exercise had seemed to be successfully increased and become part of the participants' life due to their ability to maintain the commitment to the structured exercise sessions.

Smoking

Table 4.4 show themes highlighted in each discussion group with regards to smoking, across both countries, in relation to maintaining healthy lifestyles post CR

Maintenance of behaviours	GP1-NZ	GP2-NZ	GP3-NZ	GP1-UK	GP2-UK	GP3-UK
Smoking behaviour	*	---	*	*		*
Supportive family members in quitting	*		*			*
Temptations					*	*
Socio-cultural behaviour	*		*			*
Upbringing	*					*
Media adverts						*
Self motivation						*
Positive attitude						*
Good self control						*
Cardiac Events				*	*	
Professional advice and requests				*	*	

NB: Highlighted within this table are the factors that are common across both countries, UK and NZ.

Factors that affected maintenance of smoking cessation differed between the two countries but also between each group. With limited similarities most people who had smoked had successfully quit and managed to maintain this behaviour. It was the general

consensus that the ability to continue this healthy behaviour was aided by supportive family members and friends. However, there was a significant mention of the socio-cultural behaviour of that time, which influenced many lifestyle behaviours. This was clearly seen when a UK participant states *'I was brought up in this situation, where if you had parties you always had a box of cigarettes … and that was it ya know that tempted everybody'.* Being in a society when younger, that promoted smoking made it easy to take up this behaviour. Another NZ participant agreed when he said *'you go in a pub in the old days ya know playing your cards and whatever your smoking'.* However, now being in a society who have similar anti-smoking laws and culture that now condones it can influence and support their ability to maintain healthier non-smoking lifestyles.

Diabetes

Table 4.5 show themes highlighted in each discussion group with regards to diabetes, across both countries, in relation to maintaining healthy lifestyles post CR

Maintenance of behaviours	GP1-NZ	GP2-NZ	GP3-NZ	GP1-UK	GP2-UK	GP3-UK
Diabetes	*	---	---	*	---	*
Greater support	*			*		
Professional staff	*					*
Realistic practical guidelines						*
Still require support				*		*
Struggle with food constraints				*		
Wife's input				*		

Only three discussion groups had diabetics, therefore it was hard to decipher any similarities or differences between the countries in regards to support and CR experience. Some diabetics in both countries mentioned that they received greater ongoing support for their diabetes compared to heart conditions. The participants in UK mentioned the need for continuing support for their diabetic conditions, whereas this was not mentioned by the NZ participants.

Other significant factors highlighted from thematic analysis

Stress

Stress was not significant to comment on, as it was not a common phenomenon for the groups, only for a few individuals.

Medication

Medication also was not a subject that was commented on too frequently. It seemed medication was necessary and automatically easily incorporated within these individuals' lifestyles.

Alcohol

Alcohol interestingly came up significantly more within the UK. It was interesting to find that many actually had increased their alcohol intake in response to their CR experience. However, the type of alcohol had changed, for example, more people drank red wine regularly and those who previously consumed unhealthier alcoholic beverages such as beer, now actually consumed less beer but more red wine on a regular basis. A participant from the UK stated '*I cut down dramatically especially beer' and 'mine has increased…its red wine though'.*

Further Observations directly related to participants of the study

Lifestyle changes in response to CR

All participants reacted positively and assertively to the education received and made at least some if not many healthy lifestyle changes. They all seemed extremely motivated by the fact that they felt they had a better quality of life in response to maintaining healthier lifestyles. The two most significant topics that were perceived as being the biggest behaviour to modify were diet/nutrition and exercise. When asked the question along the lines of; '*what was the most significant thing that you had changed*?', the discussion groups within the UK firstly mentioned diet/nutrition, whereas NZ groups firstly mentioned exercise. Although this difference existed, later in discussion, diet for the NZ participants and exercise for the UK participants was highlighted in conjunction with the other. The participants across both countries made dietary changes, even if it was just cooking methods, portion control or label reading when shopping. Even though NZ seemed to have

detailed education on label reading, label reading more significantly came up within the UK, showing that education is not enough alone to change behaviour. They attended the exercise sessions in the structured setting at least twice a week and continued to walk as much as they felt possible. Motivation derived from feeling bad physically and mentally if exercise sessions were missed, thus, provided an incentive for all participants to continue their exercise routine. This is clear to see when a UK participant said '*now if I miss the gym I really do feel I've done something wrong'.*

All groups within NZ were extremely enthusiastic and dedicated to the exercise sessions within the Massey Cardiac Clinic. It seemed to be very much a part of their life now indicating a healthy lifestyle change. However as also indicated in the thematic analysis tables, a major component of attending the exercise sessions relied heavily on the social element of the sessions. This was similar for the UK; they also had significant indications to the social element of the exercise, motivating them to continue attending the exercise sessions.

Monitoring and Confidence

The UK participants highlighted more significantly CR improving their confidence for exercise and also to monitor their own health status. This was not so significant within participants within NZ. However NZ exercise sessions still provided the element of monitoring blood pressure and pulse even though they were well into their maintenance phase, so their ability to monitor themselves in NZ was restricted by this factor. Whereas in the maintenance phase in the UK, there was no regular monitoring at each session and sessions were led and driven by dedicated volunteers who were once patients' themselves, thus providing them with more independence to gain confidence themselves.

5. Discussion

There is continuing developments within the treatment for CVD related conditions and measures are being taken to improve the service both across the UK and NZ. However compliance with healthy behaviour intervention and maintenance seems discouragingly low (Burnell, 1995). There is little known about those who do drop out (Sorensen *et al.,* 2006), however identification of facilitators and barriers for adopting more healthy behaviours within this section, may highlight future areas to address, as the removal of barriers is critical in reducing disease burden (Mochari *et al.,* 2007). In this next section the results will be discussed looking at themes which emerged and cut across the different topics of discussion which initially can affect behaviour change.

Maintaining healthy behaviours and the surrounding factors

As mentioned previously, when talking about maintaining healthy behaviour, only a few individuals felt this relevant to stress, smoking, diabetes and medication. Therefore, it was harder to comment on, and deduce any consistent findings due to the inconsistency of these topics affecting the minority of participants. One thing that was highlighted within those that did perceive these topics as relevant to them, was the mention of support systems, whether this be professional, medical or family related, support was a key factor which will be later discussed in this section. They also highlighted the relevance of social conditions. They felt their socio-cultural environment was supportive of their condition, as opposed to when they were growing up; the culturally accepted behaviour seemed to be perceived as a reason why they had developed this condition. For example, many smoked as it was culturally acceptable and popular to do so many years ago, whereas now it is much less supported within the environment, and both countries now have anti-smoking laws making it less acceptable for public smoking.

Facilitating the maintenance of healthy behaviour

Education, understanding, perceptions, motivation, and mental attitude

The participants had successfully changed aspects of their lifestyles including nutritional intake, whether it was actual food intake modifications or healthier cooking methods. This was in response to their CR experience. The types of behaviour that changed in regards to diet/nutrition was the change in actual dietary intake, taking more care when shopping,

reading the labels, and greater portion control. However, it was the aspects of the experience of CR that facilitated these behaviour changes. The education, knowledge and understanding gained throughout the patient's CR experience seemed extremely significant across both countries in regards to diet. It was more significant for the NZ participants when talking about exercise.

Health education is an extremely important part of the CR experience for correcting patients' misconceptions, facilitating healthy behaviour change and maintenance within their lifestyles (Coats *et al.,* 1995; Cooper *et al.,* 2002). This is extremely important as firstly tackling any misconceptions and perceptions can initially affect behaviour (Barter-Godfrey *et al.,* 2007; Creadon, Moore, & Zeller 2007; Midlov *et al.,* 2008). This is evident in this study with a couple of the UK participants, as these few individuals failed to accept their condition. Their perceptions of their conditions could therefore be responsible for their lack of behaviour change in regards to diet and exercise.

Increases in knowledge can also help to motivate, encourage and increase the perceived control that the individual has in their own health (Coats *et al.,* 1995). These factors highlighted are all significant to facilitating and maintaining healthy nutritional and exercise behaviour, within both the UK and NZ for the participants of this study. Increases in knowledge, provide healthier opportunities for individuals to make healthier choices (Mancuso *et al.,* 2006). However, it is important to recognise, that knowing what is right does not automatically make the participants do the right thing, and there is great emphasis on the affect of motivation and mental attitude of individuals (Oldenburg, Graham-Clarke, Shaw & Walker, 1995). This corresponded with the findings in this study. Motivation refers to the desire to perform a given behaviour; where as mental attitude refers to the thoughts that are associated with a given behaviour and they both can facilitate most of behaviour (Kok, Hospers, den Boer & de Vries, 1996). Both aspects can therefore affect each other and are affected by many factors.

Motivation and mental attitude is an extremely important part of maintaining behaviour (Donker, 2000; Kok *et al.,* 1996; King & Martin, 1993). This can be clearly seen in this study. Many participants accepted that they had to have a positive attitude and motivation towards changing. In retrospect, lack of motivation and negative attitude can result in a

lack of maintaining healthy behaviours (Donker, 2000). This study also highlights that as well as affecting adoption of healthy behaviours, motivation and mental attitude can be affected by many factors, for example; support, encouragement, enjoyment, positive experiences, and internal and external incentives. These can facilitate and reinforce establishment of healthy behaviours (Barter-Godfrey *et al.,* 2007; Cooper *et al.,* 2002; King & Martin, 1993).

It is important to note that education can therefore have the first initial effect on facilitating improvements in motivation and mental attitude (as clearly indicated in this study), but this alone is not sufficient, which is why it is only part of the behavioural strategies incorporated in CR (Donker, 2000). A combination of factors affecting behaviour change was reflected in a number of individuals in the UK groups in this study, who, although they have been educated, they fail to accept their condition, irrespective of their increase in knowledge. A lack of acceptance and denial result in less likelihood of change and maintenance of healthy lifestyles (Mochari, 2007). However, a better understanding can help motivate and encourage positive mental attitude, thus improving the likelihood for maintaining healthier behaviours (Coats *et al.,* 1995). The participants in this study practiced healthier lifestyles as with more knowledge and understanding; they were more equipped to make healthier choices.

Support; professionals, family, friends

Support was also highlighted as a significant factor for facilitating the maintenance of behaviour within the UK and NZ, and is recognised by Berkman and Orth-Gomer (1996), as influencing behaviour and disease status. This was significant for all topics especially, smoking, diet and exercise. The CR experienced by the participants provided them with adequate support for educating, guiding and motivating them to make changes and maintain them. This was facilitated by the professional organisations encouragement and support for the programme and participants, in which all participants seem extremely grateful for. This is supported by a study from Barter-Godfrey *et al.,* (2007), who found that support improved motivation to continue with healthy lifestyles, as it was thought to be encouraging, as when supported by professionals, the participants felt cared about and more motivated to maintain a healthy lifestyle. This seemed more significant for exercise than diet. Observations showed that support was more significant within the UK and for longer periods of time in respect of all aspects of CR and not just exercise.

Diet was much more affected by support from family members. Although family members could also facilitate the maintenance of exercise by supporting their partners through encouragement or even attending the exercise sessions, in shared households, family members seemed to have a direct influence on food that was purchased, prepared and consumed (Barter-Godfrey, 2007). This kind of support could act as a barrier to consuming a healthy diet, and increase the risk of failure to maintain healthy lifestyles (King & Martin, 1993). However, the participants within the groups, mentioned more significantly by NZ participants, had supportive family members that made lifestyle changes much easier. It was mentioned within these discussions that, providing a healthy diet and changing the food consumption for yourself, was made much easier and more likely maintained when the supporting family members change their food consumption. This, therefore, reduces temptations, highlighting it as a healthier adjustment rather than a lack of what you desire, as watching other family members eat foods that you like but are not recommended, can often demotivate the individual. Some participants have to have great self-control and motivation when their partners are less supportive and still practise unhealthy diets.

This highlights the emphasis on engaging with the families within CR, especially when many male participants have their food prepared by their female partners. This engagement with families within the CR programs was observed more within the UK than NZ. It is here that it is extremely important that the partners are also well educated and motivated in providing the participants and themselves with a healthy diet. This was evident in the EUROACTION study, when families were included within the CR programmes, as they all successfully made healthier food choices and became more physically active and patients' made greatest changes when partners had made similar changes (Wood *et al.,* 2008). Therefore, support provided by professionals and families can help enhance healthy lifestyle maintenance (King & Martin, 1993).

Social Support and the Environment

Support can also come in a social form. It is this kind of support within the given environment that appeared most significant to all the participants in both the UK and NZ. With regards to maintaining healthy exercise regimes, social support is considered to positively influence survival and recovery post MI (Berkman & Orth-Gomer, 1996). Most

participants attend the given exercise sessions for the maintenance phase of CR. They often mentioned that they are encouraged by the support from their friends and professionals within the group, providing them with social interaction and positive experiences (Coats et al, 1995; King and Martin, 1993). These exercise sessions provided at Massey in NZ and the fire station outlet gyms for those who have attended St Catherine's in the UK, provide social support and interactions to form new relationships, which in turn is thought to improve exercise maintenance and CV health (Berkman & Orth-Gomer, 1996; Donker, 2000; Mc Neill, Kreuter, & Subcamanian, 2006).

CR therefore has provided these individuals with supportive environmental possibilities that are important for individual attitudes and behaviour (Donker, 2000). The structured exercise sessions provide the participants with a safe, friendly, familiar environment to exercise in, they are not intimidated (Coats *et al.,* 1995), and are comforted by the fact that they are exercising and socialising with people they can relate to.

Attending the sessions with friends who they feel they all have something in common with, gives them a sense of belongingness with the use of supportive group dynamics (Oldenburg *et al.,* 1995). Participants mentioned that they feel wanted, they feel they are a support network for each other and are committed to this prospect, thus encouraging and motivating them to maintain the exercise sessions improving their well-being (Berkman & Orth-Gomer, 1996). This acts much like a 'Therapy Centre'. This is important as it is recognised by Oldenburg *et al.,* (1995), that compliance is facilitated by the use of supportive group dynamics. Providing the participants with an enjoyable session, where they can socialise, can have a great positive effect on maintenance of an active lifestyle. Being in similar situations and sharing experiences enables the patients' to learn from each other, resulting in an empathetic and enthusiastic group (Oldenburg *et al.,* 1995). This does seem evident of the groups that were observed as the access to support and adequately perceived environment had immediate incentives for maintaining behaviour change.

This recognition that perceived social support, from professionals as well as friends, can motivate the individual to maintain healthier lifestyle changes (Dixon-Woods *et al.,* 2005), proved extremely important in regards to this study. This conflicts the findings of Sweet *et al* (2011), who suggest the most significant factors for facilitating behaviour are those that

are internal, whereas in this study, the significance of providing a supportive, appropriate, social environment, suggests that external factors can be most significant in facilitating healthy behaviours. The findings in this study, accentuate the importance of providing participants with an option of social support in a non-intimidating environment, in regards to the required exercise uptake; as it was general consensus that exercise would not be completed if it was not for the sessions that the participants had access to and were now committed to in both countries. This highlighted the importance of company when exercising. This is evident from a participant from both NZ and the UK, when discussing the purchasing of home exercise equipment, in which they had never touched. They lacked the motivation to exercise alone and needed the company of a group and a structured exercise session, in order to complete the recommended exercise. This is recognised by Cooper *et al.,* (2002) when he documented that American Heart Association (AHA) acknowledges that social profiles may predict non compliance with CR advice. This is a significant aspect to be considered for future organisations providing exercise sessions for similar individuals in order to improve compliance. Therefore improving safe social environment and social support, can improve exercise and healthy behaviour maintenance, CV status and quality of life (Berkman & Orth-Gomer, 1996; Koch Li, Lauer, Sabik, Starr, & Blackstone, 2007)

Incentives

Incentives act as a strong indicator for exercise maintenance, as they encourage and motivate the individual to continue their healthy behaviour (King & Martin, 1993). Incentives found in this study include the element of enjoyment (King & Martin, 1993). Exercising in a friendly environment where companionship exists enhances the chances of enjoyment and positive experience, thus improving motivation and adherence to exercise (Barter-Godfrey, *et al.,* 2007; Donker, 2000; King & Martin, 1993). Also, those who had dogs were more likely to go walking outside of the exercise sessions. It is noted that when an individual lacks the motivation to walk for himself, being committed to their pet's needs, gives them the incentive and motivation to go walking. A further incentive is maintaining healthier lifestyles make them feel better mentally and physically, motivating them to continue this behaviour (King & Martin, 1993). Although this was more openly discussed in the UK groups, it was mentioned across both countries the bad feelings experienced if they were to miss an exercise session or binge on unhealthy food; this motivates them to continue to attend.

It is safe to say that the participants in this study have managed to maintain healthy lifestyles for some time in response to their CR experience. They spoke of mainly positive experiences, with a great deal of support from all aspects of their environment in order to develop great motivation and positive mental attitude for maintaining healthy lifestyles. Although these individuals have made and maintained successful changes, the discussion groups still identified those aspects that potentially act as barriers, to their maintained healthy lifestyles.

Barriers to the maintenance of healthy lifestyles

Through the discussion groups, aspects that made it hard for participants to initially change and still maintain healthy behaviour were also highlighted. Time constraints can be linked with perceptions, which can affect a variety of behaviours and here it is perceived as exercise requires more effort and time (Barter-Godfrey, 2007; Creadon, Moore, & Zeller, 2007). It can sometimes be perceived as time consuming which may not actually be related to actual time (Mochari *et al.,* 2007; King & Martin, 1993). As pointed out by one of the participants, it is about changing your attitude and making it a priority. This is equally thought to be linked to the participants successful exercise regime as they do make it part of their lifestyle routine (King & Martin, 1993). However, sometimes during busy periods, such as holidays, maintaining exercise is challenged by the concept of having a lack of time to complete it. Bad weather conditions also challenged exercise maintenance (King & Martin, 1993). This was found to effect exercise outside the sessions more so, such as walking. Participants were less likely to get out walking if it was too cold, snowy or rainy. This was out of the control of the participants and could continue for some amount of time. The structured indoor exercise sessions, however, were potentially unaffected.

Other factors that were significant in both countries were the effects of physical abilities/disabilities and illness on the capability to maintain healthy behaviours, and it is supported by Barter-Godfrey *et al.,* (2007). This seemed extremely frustrating for those affected as it was general consensus that participants felt bad when missing sessions. There is mention of growing old and being effected by other problems such as arthritis and knee problems, but participants seem as motivated as possible to do their best to work around these issues.

With regards to diets for participants in both countries, temptations still act as a barrier in maintaining healthy lifestyles. These include fast food outlets, unhealthy foods in the house which are options for other members of the households, and also supermarket offers that present unhealthy options at a much cheaper cost. Although this was mentioned in both NZ and the UK, NZ participants mentioned more influence of media and food marketing. This could be due to the lack of continuing dietary advice available for these participants compared to the support the UK participants continuingly receives. Also highlighted was the effect of conflicting advice, which can be portrayed by the media. Research is constantly being updated and thus recommendations are modified, but this can add confusion and effect belief in healthy advice that is given. Past experiences of the patients also seemed to effect the belief in advice from professionals, this was highlighted more so in the UK when it was mentioned that the Nurses who had advised patients to stop smoking, smoked themselves. This only signifies the degree of influences that can have affect on adopting and maintaining healthy behaviours.

Other factors that was more significant in NZ, included affects of family members in relation to exercise. This could be linked with the perception of lack of time. Due to family commitments (Cooper *et al.,* 2002), the exercise was perceived as being inconvenient (Barter-Godfrey, 2007; King & Martin, 1993). Participants felt family commitments were a priority and could affect their time and ease to complete exercise. The exercise sessions that were provided early morning, before work, were therefore adequate for those participants.

Opportunity, access and work (Barter-Godfrey, 2007), were also perceived to act as barriers in NZ. People who worked long hours felt they were too tired or had no time to fit exercise in. The opportunity and access to structured sessions was clearly greater within the UK compared to NZ, which may be why this was highlighted in NZ. This is significant as healthy behaviours can be affected by what is available (Barter-Godfrey, 2007). The options for structured cardiac exercise sessions, was available to this group with a set 3 days a week, at two available times only 7.00 am and 7.30 am. If this was not a possibility for the participant, there was no other option. NZ is much vaster than the UK and there is less public transport available. The UK had 5 days a week 8-12am, offering a much wider variety, better sociable hours, more transport, thus increasing the possibility for attendance

and maintenance. Although participants were free to exercise at all times themselves, it is clear the significance of having available structured exercise sessions, which provide company and motivation, seemed to aid the participants of this study in maintaining healthy lifestyles.

Observations

Identifying further similarities and differences affecting possibilities for behaviour change

Cost, socio-economic status and health service

Another factor that had less significance, but is still worth mentioning is the aspect of money. Cost came up in every discussion group, however it was in regards to a variety of subjects. Although it did not affect their behaviour, it did frustrate participants that costs of healthier foods presented less available and more expensive. The cost to exercise seemed reasonable, however differences did occur. Most of the individuals, who sought out their own treatment at Massey Cardiac Clinic, did so as they were able to afford the cost of the 12 week payment scheme which was $200 per term. Although this is a very reasonable cost when broken down per session, it works out at about £4 a session, which equates to £12 a week. This money is also paid upfront and in bulk, compared to paying as and when you come in the UK. It is also important to note that participants were required to pay for this service even in phase II and this differs somewhat to the equivalent phase II and III in the UK which is free. This seemed to reflect in the type of people that attended which was mentioned by two participants in NZ. They were of a higher socio-economic status and were able to afford the payments. However this may also act as a motivation to commit and attend all sessions. The lower cost of UK sessions of a donation of £1.50 per session, seemed to broaden the access and opportunity for those of lower socio-economic status. However, cost seemed to play a big part in attendance across both countries. It was slightly more expensive within NZ than the UK, however the cost was perceived as acceptable, irrespective of the status of the participants, this was a greater incentive for their desire to continue exercising. If the cost was to increase, many said they would question their commitment to the exercise sessions.

The difference in socio-economic status between the participants in the UK and NZ, did differ from the researchers perspective, however this may be due to the fact that to take part in the NZ structured sessions required more expense, thus maybe presenting a higher

social status of people than the UK. It was also evident that these participants in NZ could either afford the sessions or could afford health insurance, which seemed a great difference between NZ and the UK, suggesting that those with lower socio-economic status would not have access to such organisations (Mochari *et al.,* 2007).

When looking at the maintenance phase exercise sessions in the UK, being free for a longer amount of time, slightly cheaper at maintenance phase, more available and not requiring health insurance, reaching more people of a variety of socio-economic status, increases the possibility of improving the population's health after CR. Aldrich *et al.,* (2003), recognise that access to health service, ability to act on health advice and capacity to modify risk factors are influenced in the way that people live and work. They recognise that access and cultural barriers are significant in NZ, as a user pay system, identifies those that are self motivated to change their health and also can afford to seek the required treatment, thus this would greatly affect those who can access such interventions. This was a big difference observed from those who signified the importance of having health insurance in NZ, and those who had undergone the process through the available publicly funded NHS treatment in the UK. This also highlighted the differences in the UK having a more preventative health intention, compared to a more reactive system in NZ. It is also important to mention that the participants who attended did find the cost reasonable, which facilitated their attendance as many said they would question their commitment if the price was to increase, it is those that did not attend and seek out this treatment that the effects are unknown.

Service availability

Professional Support and the referral process

The UK participants although they also seemed extremely enthusiastic and dedicated to life long exercise, they also seemed to have experienced a smoother referral process, with a lot more support available than those in NZ. The availability of service was influenced by a lack of referrals in NZ. Participants in the UK underwent a smooth referral process from one phase to the next; being informed constantly of the next action, being supported in this transition of what is available. They attended the first III phases within the same organisation, Wirral Heart Support Centre, and then were clearly offered reduced prices within commercial community gyms or onto the community cardiac friendly gyms, in which

attendance was only allowed if they had completed the programme at St Catherine's Hospital. They were then followed up at 6 and 12 months. They presented a better linkage system for further exercise within the UK, and increasing chance of maintaining exercise behaviour (Kok *et al.,* 1996). Although there was a freedom of choice, the system was so established that it was easy for the patients' to make the healthier choice and to continue with the process provided for them.

However, NZ did not experience such a smooth referral process. Unlike the UK, in NZ the transition to the next phase was not well supported and established. It was also not within the same organisation. This was quite evident from the lack of referrals in the observation period. Patients' who attended had done so for years and classes were not getting any bigger. The patients' would complete phase I and II within Wellington hospital. It was then that the patients' would pass through to an additional 6 week exercise phase at Massey Cardiac Clinic, or onto phase III within the community.

Compared with other western countries like the UK, NZ referral rates are low in all centres with or without facilities and only 12% of those eligible completed phase II of CR (Sharpe & Wilkins, 2004). Adherence to healthy lifestyles seems to be a significant problem and up to half who engage in maintenance exercise programmes in the UK drop out in the first six months (Barter-Godfrey, 2007). Of those referred to CR, only a third attends (Wood *et al.,* 2008). However, in this study NZ illustrated more of a lack of referrals than the UK. In NZ, 25% of eligible patients' who attend CR are not referred officially and 56% of those eligible do not attend (Doolan-Noble, 2004). The patients' in this study were not referred or advised, but lacked further support and it was up to them to seek out the Clinic by either word of mouth or leaflets and make the relevant phone calls to improve their lifestyles. The participants then had to be motivated to follow this up. In developed countries like NZ where Physicians are reimbursed according to fee for service, procedural medicine instead of behavioural therapy can seem more financially rewarding, and doctors fail to see a well established role for preventative medicine (Oldenburg *et al.,*1995). This was evident when observing these patients', as they often felt that they were misguided with the belief that after undergoing medical procedures in relation to their heart conditions, it was thought that the problem was fixed, however they were motivated to seek out lifetime behavioural exercise management and prevent further CV events themselves. These observations in this study highlights that poor referral rates in NZ is an important challenge to overcome as

it is thought that poor adherence could contribute to the CVD rates, and is an indicator for future health trends and economic costs (King *et al.,* 2009; Mochari *et al.,* 2007).

It is recognised that a lack of follow-ups, education, advice and referrals in NZ can affect maintenance of healthy behaviour. There is a lack of outpatient and community based rehabilitation, and this lack of maintenance programmes can inhibit benefits already gained and result in a relapse of healthy behaviour and unsuccessful maintenance of healthy lifestyles (Graham *et al.,* 2008). Therefore the NZ referral process seemed to lack somewhat, compared with the UK, The UK seemed to have a more established, overall supported system for behavioural medicine, advice and referrals, within the NHS, where all professionals seemed to act under the same principles, this differed compared with the principles and attitudes changing between Physicians in NZ (Oldenburg *et al.,*1995). The amount of patients' that attended the exercise sessions in the maintenance phase was on a much greater scale than NZ, with a constant flow of patients' throughout the program.

Although these differences exist, they were all extremely motivated. Although NZ seemed more motivated in making lifestyle changes, it would be incorrect to conclude that participants in NZ were more motivated towards changing their lifestyles than in the UK, as it is just that in the given situation that participants in NZ needed to be more motivated to seek out their own treatment, than those in the UK who had easier access, more sufficient support and a smoother referral process. They all presented great levels of motivation in response to changing to healthier lifestyles and within the organisations they showed gratitude and appreciation for the support that they did experience, and the continuing positive experiences they still encounter within these organisations.

CR Programme

After observing NZ's 6 week exercise phase II programme, it was much like the UK phase II. This included exercise and education. NZ seemed to have a greater emphasis on self management. This could be due to the fact that the patients' then left after 6 weeks and were offered advice on Green Prescription which included telephone support follow up to talk to professionals about how they were maintaining their lifestyle, or the options to join community walking groups. The participants used in the study actively chose a further option and went into Massey Cardiac Clinic in which they underwent 12 weeks of exercise

to facilitate their maintenance of exercise in their lifestyles. This option was one of the only institutions in NZ that provided such programmes and with such a success rate, it is recommended that this service can develop and establish in other areas of NZ. This programme was monitored and therefore acted much like phase III in the UK. Those in the UK had emphasis on self management but seemed to be supported much more due to the service that was offered; as, they underwent the phase II 6 week programme much like NZ and then onto the supervised gym 12 week programme, which they did in the same place with the same staff. They were much more supported in their changing and maintenance of healthy lifestyles due to the longer amount of time that it took to complete the programme. They then went onto lifetime exercise still supported by the same organisation who still actively monitored their progress. However, this does not occur all over the UK and therefore this may identify an element that could improve the service in other parts of the UK and heighten the possibility of maintaining healthy lifestyles.

Learning new habits to the extent that they become natural and automatic requires time. As disease prognosis is influenced by adherence to programmes and lifelong healthy behaviour, the UK offering a longer and more readily available service could increase the positive health outcome of CR individuals compared to NZ. It is thought that a 1yr minimum treatment period is the minimum time required for altering behaviour (Burnell, 1995; Burke, 1999). A comprehensive programme is thought to be 2-4 months in phase II with an individual follow on of phase III maintenance phase of 4-12 months plus (Certo, 1985). NZ active programmes offered to those who need it, include intervention of only 6 weeks, the next optional 12 week exercise stage is not readily offered and requires much more effort from the individual to adhere to. It is hoped that 6 weeks is enough to motivate the individual to continue. This is a significant difference from the 6 weeks, onto 12 week intervention programmes readily offered to the UK patients'. NZ require longer strategies to be built into the programme for maintenance (Burnell, 1995).

In contrast, the lack of referrals that went through Massey Cardiac Clinic, lessened the need to move patients' on to community exercise which was not supported by surrounding organisations. Therefore, patients' continued to attend the clinic for many years and actively completed their lifestyle exercise along side those who were still in phase II. This pleased the individuals as they were extremely grateful of the support they received here, however their monitoring and reliance on this still continued, hindering their independence

in being able to asses their own health status. Through observation of the UK participants, it was clear that they were much more capable of assessing their own health and responses during exercise and within their life, knowing their own signs and symptoms. However, the NZ participants seemed less able to do this, still lacking understanding of signs and symptoms, relying on monitoring and still anxious of exercising at more intense levels outside of the monitored sessions, hindering future personal development, competence and confidence. This was recognised by Berkman and Orth-Gomer (1996), when they stated that support that decreases competence and independence could be damaging to recovery. Limiting the opportunity for self assessment, could lessen their belief in their own competence, limiting them from becoming more independent in their own recovery and prevention (Burnell, 1995). This also fails to attain one of the aims of phase III, which is for the individual to be able to monitor their own heart rate, and use RPE effectively (Coats *et al.,* 1995). Lacking a smooth referral process presented the limited amount of patients' that actually undergo this kind of exercise behavioural intervention. With only one of these structured exercise sessions available in the area, it was limited in the people it could reach although it was led by extremely dedicated volunteers. Those in the UK had the choice of attending over 10 options of exercise outlets in response to CR, benefiting a higher percentage of people than NZ, who required access to such a service.

Demographics

It is clear that the differences in opportunity to CR programmes differ between countries. In the UK, opportunity to undertake CR programmes is more affected for people of lower education, and economic status, this is irrespective of ethnicity. However NZ differences in demographic groups seem more relevant to ethnicity as there is a greater difference in equalities for access to treatments between Maori and non Maori opportunities for CR programmes (Doolan-Noble *et al*., 2004; Sharpe & Wilkins, 2004). It could be that socioeconomic inequalities in CVD are greater in NZ than in the UK (Doolan-Noble *et al*, 2004).

Although there have been declines in CVD rates in both the UK and NZ, there seems to be a difference in reasons for this decline which could be linked to cultural differences. In the UK as a whole, decline in CVD rates can be explained by risk factor reductions, whereas reductions in NZ seem to be occurring only in certain socio-economic and ethnic groups

(Sharpe & Wilkins, 2004). Mortality rates are declining in Maori people much slower than non-Maori (Bramley *et al.,* 2004). Aspects highlighted in this study may indicate reasons why reductions occur in those from higher socio-economic groups, as they can access behavioural intervention and CR much more easily, as they can afford to either pay or have health insurance. They are more likely to be referred, have transport and be able to attend (Sharpe & Wilkins, 2004). Ethnic groups such as Maori have much higher rates of CVD and seem to have access to different treatment. They tend to be of lower socio-economic status and less likely to have health insurance. They are less likely to be referred and if so are more likely to be referred for other medical procedures than CR. This could be evident in this study as there were no Maori individuals within Massey Cardiac Clinic. It is here that the health professionals are affecting their access to different types of treatment which can in turn influence health outcomes (Sharpe & Wilkins, 2004). The UK has more of a procedural approach to what they offer on the NHS, which in turn gets equally offered to everyone that is referred. They are more likely to benefit those from different socio-economic status and of lower deprivation than NZ, as these inequalities are wider in NZ than the UK (Doolan-Noble, *et al,* 2004).

5.1 Limitations

This study looked at barriers to maintaining healthy lifestyles. Due to recruiting participants from already established maintenance cardiac groups, it increased the likelihood that they would be maintaining an all round healthy lifestyle, due to their commitment and attendance within the maintenance programmes. However, it was felt that these individuals would still identify barriers and facilitators to their successful maintenance of healthy behaviours.

Using discussion groups and reflection-in-action, makes the data collection extremely subjective to the researcher. With long gaps between each discussion groups, questions worded differently may have obtained a variety in understanding, answers and results collected. Observations made by the researcher were interpreted and therefore subjective in the conclusions that were made.

5.2 Suggestions for further developments

In response to the discussion groups and observation periods, feedback was put together and offered to the programme leaders of the given services. This presented patients' views

and offered suggestions for future development. In response to the feedback from this study in regards to NZ, positive changes have already been set in place. The findings that showed participants were encouraged to exercise in a non-intimidating environment where they could exercise with people they could relate to and develop friendships with, resulted in the development where participants would now be moved on from the monitored phase II clinic into the community gyms. However they would be referred on in groups of 2 or 3 so they would still be encouraged in exercising with others. Community gyms were being liaised with to offer better prices, ensuring a more flexible in time exercise regime.

Due to the fact that patients' felt that talking about their experiences in discussion groups, allowed them to gain greater social support and clear up any misconceptions they had, the development of introducing one day a month where patients' could discuss issues, continuing their perceived support and education, aims to sustain their maintenance of healthy behaviours. The suggestion of cooking demonstrations and enjoyable activities are now also available. In response to such positive feedback, meetings with local hospitals attempts to define the clinic more as a phase II unit where patients' are more readily referred and progressed onto the next stage. This would reduce dependence on monitoring, thus improving independence and health related quality of life (Doolan-Noble, *et al,* 2004). The difference in access of treatments for NZ people is a larger subject to approach as it is affected by the country's views and established health system. The volunteers of Massey Cardiac Clinic do a fantastic and beneficial job for those who are able to attend. Making an example of the great work that is done here; making access to those services more available across the country could benefit the health of the NZ population and differences in cultural health disparities.

The UK presents a system that already involves many of the above developments made by NZ. However, feedback reveals some developments that are yet to be adopted. Discussion groups could help those who attend the fire station gyms, to again continue perceived support and allowing the opportunity for any questions. As patients' seemed continuingly confused by the changing recommendations, it was suggested that recommendation updates were available through the service to keep the individuals updated, educated, thus improving their interest and their ability to maintain healthy recommended behaviours. This was thought to be provided by the newly developed drop in service from Exercise Physiologists that are part of the CR service. It was suggested

that an increase in monitoring would benefit the patients'. Different to NZ who needed to reduce their dependence on monitoring, those in the UK get monitored once every month. It was required that records were kept to ensure patients' could compare their pattern of blood pressure. It was suggested by the service, that the patients' were to be given a card in which they can note down their readings, that way patients' were still in control of their health. Record cards are now offered.

6. Conclusion

The experience of completing CR programmes has been successful in supporting the individuals to maintain healthy lifestyles. Positive CR experiences of a variety of support, education, positive mental attitude, and motivation have all helped to facilitate this. The exercising friendly environment posed extremely important to the maintenance of exercise. Having the opportunity to have companionship and exercise in company with people they can relate to actually determines these participants exercise behaviour. The participants have experienced adequate, facilitating CR programmes. However these aspects also present elements that if not adequate, could have detrimental effects to maintaining healthy behaviours.

Barriers highlighted to challenge maintenance are things such as physical disabilities, time constraints and weather conditions. Those in NZ seemed to be more affected by external factors such as opportunity, access and work. This may be due to the lack of readily accessible services. Participants are required to be more active in seeking their own treatment due to the lack of referrals, and also need to be able to afford the service that they require.

Due to great emphasis on support and friendly exercising environments, future developments for improving referrals to behaviour intervention in NZ for every CVD patient for recovery and secondary prevention (Burnell, 1995), should be provided. Improvements in opportunities to access exercise sessions, specifically for individuals with CV conditions ensuring they can exercise in company and with companionship, could be a facilitating factor for improving exercise maintenance of CVD individuals. Including families within CR can also improve support and the likelihood of maintaining healthy behaviours. Introduction of discussion groups for both countries would continue education and perceived support, as communication can discover and tackle barriers, motivating the individuals to continue to maintain healthy behaviour (Midlov *et al.,* 2008). Exploring patients' views and experiences through discussion provides feedback and can assist in future developments (NICE, 2007), as a lack of addressing barriers can sometimes be the reason why health education is ineffective (Kok *et al.,* 1996). This is also recognised by Puska (1996), who emphasises that continuing education and long term follow up can improve healthy behaviour maintenance. This study indicates the important suggestion for

new established options, recognising external influencing factors, such as continued support and structured exercise sessions, where cardiac individuals can exercise in a friendly, social environment, for all areas of the UK and NZ.

References

Adams, B.J., Carr, J.G., Ozonoff, Lauer., M.S. & Balady, G.J. (2008). Effect of exercised training in supervised cardiac rehabilitation programs on prognostic variables from the exercise tolerance test. *American Journal of Cardiology, 101*; 1403-1407

Ades, P.A. (2001). Cardiac Rehabilitation and Secondary Prevention of Coronary Heart Disease. *The New England Journal of Medicine, 345 (12); 892-902*

American Heart Association (AHA) (2010). Heart Statistics. Retrieved on 17th November 2009 from *www.heartfoundation.org.nz*

American Heart Association (AHA) (2010). Prevention. the Heart.org. Retrieved on 17th November 2009 from *www.theheart.org*

Arnold, H.J., Sewell, L., & Singh, S.J. (2007). A comparison of once verses twice weekly supervised phase III cardiac rehabilitation. *The British Journal of Cardiology, 14; 45-48*

Aldrich, R., Kemp, L., Wiliams, J.S., Harris, E., Simpson, S., Wilson, A., McGill, K., Bytes, J., Lowe, J., & Jackson, T. (2003). Using socioeconomic evidence in clinical practice guidelines. *British Medical Journal, 327; 1283-1285*

Balady, G.J., Ades, P.A., Comoss, P., Limacher, M. Pina, I.L., Southard, D., Williams, M.A., & Bazzare, T. (2000). Core components of Cardiac Rehabilitation/Secondary Prevention Programs: A Statement for Healthcare Professionals from the American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation Writing Group. *Circulation, 102; 1069-1073.*

Barter-Godfrey, S., Taket, A., & Rowlands, G. (2007). Evaluating a community lifestyle intervention; adherence and the role of perceived support. *Primary Health Care Research and Development, 8; 345-354.* UK: Cambridge University Press

Berkman, L.F., & Orth-Gomer, K. (1996). Prevention of CV Morbidity and Mortality: Role of Social Relations. Cited in Schneiderman & Orth-Gomer (1996) (eds) *Behavioural Medicine Approaches to Cardiovascular Prevention, 51-67.* New Jersey: Lawrence Erlbaum Publishers

Blair, S.N., Powell, K.E., Bazzarre, T.L., Early, J.L., Epstein, L.H., Green, L.W., Harris, S.S., Haskell, W.L., King. A.C., & Koplan, J. (1993). Physical inactivity. Workshop V. AHA Prevention Conference III. *Behaviour change and compliance: keys to improving cardiovascular health. Circulation, 88, 1402-1405*

Boyatzis, R. (1998). *Qualitative Information*. US: SAGE Publications Inc

Bramley, D., Riddell, T., Creagle, S., Curtis, E., Harwood, M., Nehua, D., & Reid, P. (2004). A call to action on Maori Cardiovascular Health. *The New Zealand Medical Journal, 117; 1197-1957*

British Heart Foundation (BHF) (2008). Cardiovascular Disease Mortality Rate. Retrieved on 4th December 2009 from www.cqc.org.uk

British Heart Foundation (BHF) (2007b). *The National Audit of Cardiac Rehabilitation: Annual Statistical report*. London: British Heart Foundation

British Heart Foundation (BHF) (2007a). National Campaign for cardiac Rehabilitation. Retrieved on 2nd December 2009 from www.cardiacrehabilitation.org.uk/docs/scientific.pdf

British Association of Cardiac Rehabilitation (BACR) (2002). *Phase IV Training Manual.* Leeds: Human Kinetics Europe Ltd

British Heart Foundation (BHF) (2002). Office for National Statistics (2002) General Household Survey. Retrieved on 7th July 2010 from *www.heartstats.org*

Bryman, A. (2004). *Social Research Methods, 2nd Edition*. USA: Oxford University Press

Bundy, C. (2004). Changing Behaviour: using motivational interviewing techniques. *Journal of the Royal Society of Medicine, 87(44); 43-47*

Burke, L.E. (1999). Adherence to a Heart-Healthy Lifestyle- what makes a difference? Cited in Brubaker, P.H., Kamisky, L.A., & Whaley, M.H. (2002). *Coronary Artery Disease: essentials of prevention and rehabilitation programs.* USA: Human Kinetics

Burnell, G. (1995). Behaviuoral Medicine Interventions in Secondary Prevention of CHD. Cited in Schneiderman & Orth-Gomer (1996) (eds) *Behavioural Medicine Approaches to Cardiovascular Prevention, 51-67.* New Jersey: Lawrence Erlbaum Publishers

Certo, C.M. (1985). History of Cardiac Rehabilitation. *Physical Therapy, 65(12), 1793-1795*

Chawla, L. (1998). Significant life experiences revisited: A review of research on sources of environmental sensitivity. *The Journal of Environmental Education, 29(3); 11-21*

Coats, A., McGee, H., Stokes, H., & Thompson, D. (1995). *BACR Guidelines for Cardiac Rehab.* Blackwell Science: UK

Cooper, A., Lloyd, G, Weinman, J., & Jackson, G (1999). Why patients do not attend cardiac rehabilitation: role of intentions and illness beliefs. *Heart, 82; 234-236*

Cooper, A.F., Jackson, G., Weinman, J., & Horne, R. (2002). Factors Associated with Cardiac Rehabilitation Attendance: a systematic review of literature. *Clinical rehabilitation, 16; 541-552*. London: SAGE

Cooper, J. (2004). Using participation and non participation observation to explain information behaviour. R. Lewis, C Uquhurt. *Information research, 9(4).* Retrieved on 4th December 2009 from *http./information.net*

Cortes, O., & Arthur, H.M. (2006). Determents of referral to cardiac rehabilitation programs in patients with coronary artery disease. A systemic review. *American Heart Journal, 151; 249-256*

Creadon, L., Moore, S.M,, & Zeller, R.A. (2007). Predictors of Cardiac Rehabilitation Initiation. *Rehabilitation Nursing, 32(4); 152-157*

Dalal, H.M., & Evans, P.H. (2003). Achieving National Service Framework Standards for Cardiac Rehabilitation and Secondary Prevention. *British Medical Journal, 326; 481-484*

Dalal, H.M, Evans, P.H., Campbell, J.L., Taylor, R.S., Watt, A., Read, K.L.Q., Mourant, A.J., Wingham, J., Thompson, D.R., & Pereira Grey, D.J. (2007). Home-based verses Hospital-based rehabilitation after myocardial infarction. A randomised trial with preference arm-Cornwall Heart Attack Rehabilitation Management Study (CHARMS). *International Journal of Cardiology, 199; 202-211*

Dixon-Woods *et al.,* (2005). Cited in Barter-Godfrey, S., Taket, A. & Rowlands, G. (2007) Evaluating a community lifestyle intervention; adherence and the role of perceived support. *Primary Health Care Research and Development, 8; 345-354.* UK: Cambridge University Press

Denscombe, M. (2003). *The Good Research Guide (2nd ed).* Maidenhead: Open University Press

Dolansky, M.A., Moore, S.M., & Visousky, C. (2006). Older Adults' views of Cardiac Rehabilitation Programmes. *Journal of Geronological Nursing, 32, 2; 37-44*

Donker, F.J.S. (2000). Cardiac Rehabilitation: A review of current developments. *Clinical Psychology review, 20(7); 923-943*

Doolan-Noble, F., Broad, J., Riddell, T., & North, D. (2004). Cardiac Rehabilitation Services in New Zealand Access and Utilisation. *Journal of New Zealand Medical Association, 117(1197).* Retrieved on 20th October 2009 from *www.nzma.org.nz*

Dugmore, L.D., Tipson, R.J., Phillips, M.H., Stentiford, N.H., Bone, M.F., & Littler, W.A. (1999). Changes in cardiorespiratory fitness, psychological wellbeing, quality of life, and vocational status following a 12 month cardiac exercise rehabilitation programme. *Heart, 81(4); 359-66*

Egan, F. (1999). Cardiac rehabilitation into the new millennium. *Intensive and Critical Care Nursing, 15; 163-168*

Ellis, E., Grimsley, M., Goyder, E., Blank, L., & Peters, J. (2007). Physical activity and health; evidence from a study of depreived communities in England. *Journal of Public Health, 1-8*

Finch, H., & Lewis, J. (2006). *Qualitative Research Practice: A guide for Social Science Students and Researchers.* London: SAGE

Goble, A.J., & Worcester, M.U.C. (1999). *Best Practise Guidelines for Cardiac Rehabilitation and Secondary Prevention. Heart Research Centre*. Retrieved on 5th April 2010 from *www.heartresearchcentre.org*

Graham, S.K., Cameron, I.D., & Dickson, H.G. (2008). *Analysis of draft Australian rehabilitation service standards: comparison with international standards. Australian and New Zealand Health Policy, 5;15*. Retrieved on 16th November 2009 from www.anzhealthpolicy.com

Hillsdon, M., Foster, C., & Thorogood, M. (2005). Interventions for promoting physical activity (Cochrane Review). *The Cochrane Database of Systemic Reviews, 1*

Hughes, A.R., Mutri, N., & MacIntyre, P.D. (2007). Effect of an exercise consultation on maintenance of physical activity on completion of phase III exercise-based cardiac rehabilitation. *European Society of Cardiology, 1; 114-121*

Hughes, A.R., Kirk, A.F., Mutrie, N., & MacIntyre, P. (2002). Exercise consultation improves exercise adherence in phase IV cardiac Rehabilitation. *Journal of Cardiopulmonary Rehabilitation,* 22(6); 421-425.

Hutton, J., Beale, S.J., Kruger, J., & Chaplin, S. (2008). Cardiovascular services in England: Opportunities and Challenges over the next ten years. *Cardio and Vascular Coalition*

Joliffe, J.A., Rees, K., Taylor, R., Thompson, D., Oldridge, N., & Ebrahim, S. (2001). *Exercised based rehabilitation for coronary heart disease*. Cochrane Database. Retrieved on 5th April from www.ncbi.nlm.gov/pubmed

Kavanagh, T. (2000). Exercise in cardiac rehabilitation. *British Journal of Sports Medicine, 34, 3*

King, K.M., Human, D.P., & Teo, K.K. (1999). Cardiac Rehabilitation-the Forgotten Intervention. *Canadian Journal of Cardiology, 15(9); 979-985*

King, D. E., Mainous, A.G., Canemolla, M., & Everett, C.J. (2009). Adherence to Healthy Lifestyle Habits in US Adults, 1988-2006. *American Journal or Medicine, 122(6); 528-534* Retrieved on 10th February 2010 *from* www.ncbi.nlm.nih.gov/pubmed

King, A.C., & Martin, J.E. (1993). *ACSM- Resource Manual for Guidelines for Exercise Testing and Prescription, 2nd edition*. USA: Lea & Febiger

Koch, C.G., Li, L., Lauer, M., Sabik, J., Starr, J., & Blackstone, E.H. (2007). Effect of Functional Health Related Quality of Life of Long Term Survival after Cardiac Surgery. *Circulation, 115; 692-699*

Kok, G., Hospers, H.J., den Boer, D.J., & de Vries, H. (1996). Health education at individual level. Cited in Schneiderman & Orth-Gomer (1996) (eds) *Behavioural Medicine Approaches to Cardiovascular Prevention, 51-67.* New Jersey: Lawrence Erlbaum Publishers

Kollmuss, A. & Agyeman, J. (2002). Mind the Gap: why do people act environmentally and what are the barriers to pr-environmental behaviour? *Environmental Education Research, 8(3); 239-260*

Kruegar, R.A. & Casey, M.A. (1994). *Focus Groups: A Practical Guide for Applied Research (3rd edition).* US: Sage Publications Inc

Kubansky, L.D., Kawachi, S.T., & Weiss, D. (1998). Anxiety and coronary heart disease: a synthesis of epidemiological, psychological and experimental evidence. *Annals of Behavioural Medicine, 20 (2); 47-58*

LaMonte, M. J., Eisenman, P. A., Adams, T. D., Shultz, B. B., Ainsworth, B. E., & Yanowitz, F. G. (2000). Cardiorespiratory Fitness and Coronary Heart Disease Risk Factors: The LDS Hospital Fitness Institute Cohort. *Circulation, 102, 1623-1628*

Lewin, R. J. P., Thompson, D.R., & Roebuck, A. (2004). Development of BACR/BHF minimum data set for cardiac rehabilitation. *British Journal of Cardiology, 11; 300-301*

Luszczynska, A., & Sutton, S. (2006). Physical activity after cardiac rehabilitation: evidence that different types of self-efficacy are important in maintainers and relapses. *Rehabilitation Psychology, 51(4); 314-321*

Mancuso, C., Sayles, W., Robbins, L., Philips, E., Ravenell, K., Duffy, C., Wedneroth, S., & Charleson, M. (2006). Barriers and facilitators to healthy physical activity in asthma patients. *Journal of Asthma, 43; 137-143*

Mc Neill, L. H, Kreuter, M.W., & Subcamanian, S.V. (2006). Social environment and physical activity: A review of concepts and evidence. *Social Science and Medicine, 63; 1011-1022*

Melville, M.R., Packham, C., Brown, M., Weston, C., & Gray, D. (1999). Cardiac Rehabilitation: socially deprived patients are less likely to attend, but patients ineligible for thrombolysis are less likely to be invited. *Heart, 82; 273-377*

Mitchie, S., O'Connor, D., Bath, J., Giles, M., & Earll, L. (2005). Cardiac Rehabilitation: The psychological changes that predict health outcome and healthy behaviour. *Psychology, Health and Medicine, 10(1); 88-95*

Midlov, P., Ekesbo, R., Johansson, L., Gerward, S., Persson, K., Nerbrand, C., & Hedblad, B. (2008). Barriers to adherence to hypertension guidelines among GP's in Southern Sweden: A survey. *Scandinavian Journal of Primary Health Care, 26(3); 154-159*

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: an expanded sourcebook. Ed 2, SAGE*. US: SAGE Publications

Miller, R.R., Sales, A.E., Kopjar, B., Fitin, S.D., & Bryson, C.L. (2005). Adherence to heart-healthy behaviours in a sample of the US population. *Preventing Chronic Disease, 2(2); A18*

Ministry of Health (MoH) (2004). *The health of New Zealand: Total Population*. Wellington: Ministry of Health

Ministry of Health (MoH) (2008). *Portrait of Health. Key Results of the 2006/07 New Zealand Health Survey.* Wellington: Ministry of Health

Mochari, H., Ferris, A., Adigopula, S., Henry, G., & Mosca, L. (2007). Cardiovascular Disease Knowledge, Medication Adherence, and Barriers to Preventative Action in a Minority Population. *Preventative Cardiology, 10; 190-195*

Morgan, D. L. (1998). *The Focus Group Guidebook*. USA: SAGE Publications

Morgan, D.L., & Spanish, M.T. (1985). Focus Groups: A new tool for qualitative research. *Qualitative Sociology, 7; 253-270*

Morrin, L., Black, S., & Reid, R. (2000). Impact of duration in cardiac rehabilitation program on coronary risk profile and health related quality of life outcomes. *Journal of Cardiopulmonary Rehabilitation, 20; 115-121*

Morse, J.M., & Field, P.A. (1995). *Qualitative Research Methods for Health Professionals.* London: SAGE

Murphy-Black, T. (2006). Using Questionnaires, cited in Gerrish, K. & Lacey, A. (eds). *The Research Process in Nursing*. Oxford: Blackwell Publishing Ltd

Myrtek, M., Keiser, A., Raunch, B., & Janson, G. (1997). Factors associated with work resumption: a 5year follow up with cardiac patients. *International Journal of Cardiology, 59; 291-297*

National Institute of Clinical Excellence (NICE) (2007). *Clinical Guideline 48: MI: secondary prevention in primary and secondary care for patients following a myocardial infarction.* Retrieved on 5th February 2010 from www.nice.org.uk

New Zealand Heart Foundation (NHF) (2008). *Heart Statistics*. Retrieved on 10th July 2010 from *www.heartfoundation.org.nz*

New Zealand Heart Foundation (NHF) (2002). *Technical Report to Medical and Allied Professionals; Technical Report Number 78.* National Heart Foundation: Auckland, NZ.

NHS Wirral (2010). Patient and Public Involvement. NHS Wirral. Retrieved on 7th July 2010 from www.wirral.nhs.uk

Norris, C. (2003) *Talking to your Patients about Heart Disease*. USA: Rockhill Communication. Retrieved on 5/11/09 from www.womensheartadvantage.com/prttypatid.htm

National Service Framework (NSF) (2007). The Coronary Heart Disease National Service Framework: Building for the future, progress report 2007. Retrieved on 17th November 2009 from www.dh.gov.uk

Oldenburg, B., Graham-Clarke, P., Shaw, J., & Walker, S. (1995). Modification of Health Behaviour and Lifestyle Mediated by Physicians. Cited in Schneiderman &

Orth-Gomer (1996) (eds) *Behavioural Medicine Approaches to Cardiovascular Prevention, 51-67.* New Jersey: Lawrence Erlbaum Publishers

Ornish, D., Scherwitz, L.W., Billings, J.H., & Gould, T.A. (1998). Intensive lifestyle changes for reversal of coronary heart disease. *JAMA, 280; 2001-2007*

Powell, R.A., & Single, H.M. (1996). Focus Groups. *NHS Evidence- patient and public involvement.* Retrieved on 17th July 2010 from www.library.nhs.uk

Puska, P. (1996). Community Interventions in Cardiovascular Disease Prevention. Cited in Schneiderman & Orth-Gomer (1996) (eds) *Behavioural Medicine Approaches to Cardiovascular Prevention, 51-67.* New Jersey: Lawrence Erlbaum Publishers

Puska, P. (2001). Coronary heart disease and stroke in developing countries: time to act. *International Journal of Epidemiology, 30; 1493-1494*.

Randolph, I. (1985). Long-Term Compliance. Physical Therapy, 65 (12): 1832-1839

Ritchie, J., & Lewis, J. (2003). Qualitative Research Practice: A guide for Social Science Students and Researchers. London: SAGE

Richardson, L.A., Buckenmeyer, P.J., Bauman, B.D., Rorrech, J.S., Newman, I., & Josephson, R.A. (2000). Contemporary Cardiac Rehabilitation: patient characteristics and temporal trends over the past decade. *Journal of Cardiac Rehabilitation, 20(1); 57-64*

Sanderson, B.K., & Bittner, V. (2005). Women in cardiac rehabilitation: outcomes and identifying risk for dropout. *American Heart Journal.150(5);1052-8*

Sarrafzadegan, N., Rabiei, K., Kabir, A., Asgary, S., Tavassoli, A., & Khosravi, A. (2008). Changes in lipid profile of patients referred to a cardiac rehabilitation program. *European Journal of Cardiovascular Preventive Rehabilitation*,15(4); 467-72

Schon, D.A. (1991) The Reflective Practitioner: *How professionals think in action.* GB: Basic Books Inc

Scottish Intercollegiate Guidelines Network (SIGN) (2002). *Cardiac Rehabilitation: A National Clinical Guideline.* Edinburgh: SIGN. Retrieved on 20th June 2009 from www.sign.ac.uk/pdf/sign57.pdf

Sharpe, N., & Wilkins, G. (2004). Quality and Equity in Cardiovascular Health in New Zealand: the need for agreed achievable standards of care, cohesive planning and action. *Journal of New Zealand Medical Association, 117(1197).* Retrieved on 20th October 2009 from *www.nzma.org.nz*

Singh, V. N., Schocken, D. D., Williams, K., & Stamey, R. (2008). *Cardiac Rehabilitation.* Retrieved on 8th January 2009 from www.emedicine.medscape.com/article/319683

Sorensen, J.B., Skougaord, T., & Puggaard, L. (2006). Exercise prescription in general practise; a systematic review. *Scandinavian Journal of Primary Health Care, 24; 69-74*

Strong, G., & Hinton, S. (2007). *Cardiovascular Heart Disease and Exercise referral.* BACR: Cardiff

Sweet, S.N., Tulloch, H., Fortier, M.S., Pipe, A.L. & Reid, R.D. (2011). Patterns of Motivation and Ongoing Exercise Activity in Cardiac Rehabilitation Settings: A 24-Month Exploration from the TEACH Study. *Annals of Behavioral Medicine; 41(1): 55-63*

Taylor, R.S., Brown, A., Ebrahim, S., Jolliffe, J., Noorani, H., Rees ,K., Skidmore, B., Stone, J.A., Thompson, D.R., & Oldridge, N. (2004). Exercise-based rehabilitation for patients with coronary heart disease: systematic review and meta-analysis of randomized controlled trials. *American Journal of Medicine.15;116(10); 682-92.*

Thompson, D.R., & De Bono, D.P. (1999). How valuable is Cardiac Rehabilitation, and who should get it? *Heart, 82; 546-546.*

Thow, M., Hinton, S., & Rafferty, D. (2007). *BACR-Phase IV-The UK experience so far.* Scotland: Glasgow Caledonian University

Tod, A. (2006). Interviewing. Cited in Gerrish, K., & Lacey, A. (eds). *The Research Process in Nursing*. Oxford: Blackwell Publishing Ltd

Wannamethee, S.G. (2006). Exercise is really good for you. *Heart, 92; 1185-1186*

Wenger, N.K. (1973). *Coronary Care—Rehabilitation After Myocardial Infarction.* Dallas: American Heart Association

World Health Organisation (WHO) (2002). *Preventing Risks, Promoting Healthy Life.* USA:AHA retrieved on 17th November 2010 from *www.americanheart.org*

Wood, D.A., Kotseva, K., Connolly, S., Jennings, C., Mead, A., Jones, J., Holden, A., De Bacquer, D., Collier, T., De Backer, G., & Faergeman, O. (2008). Nurse-Coordinated multidisciplinary, family-based cardiovascular disease prevention programme (EUROACTION) for patients with coronary heart disease and asymptomatic individuals at high risk of cardiovascular disease: a paired, cluster-randomised control trial. *European Society of Cardiology, 371.* Retrieved on 19th October 2009 from *www.thelancet.com*

Yoshinga, K, Beanlands, R.S.B., Dekemp, R.A., Lortie, M., Mornin, J., Aung, M., McKelvie, R., & Davies, R.F. (2006). Effects of exercise training on myocardial blood flow in patients with stable coronary artery disease. *American Heart Journal, 151; 1524*

Yusuf, S., Reddy, S., Ôunpuu, S., & Anand, S. (2001) Global burden of cardiovascular disease: part I: general considerations, the epidemiologic transition, risk factors, and impact of urbanization. *Circulation, 27; 104(22); 2746-275.* Retrieved on 3rd November 2009 *from* *www.ncbi.nlm.gov/pubmed*